Medical Lib.

Registered at the G.P.O., Sydney, for Transmission by Post as a Newspaper. NOV 30 1921 Published Weekly.

THE

MEDICAL JOURNAL OF AUSTRALIA

(With which "The Australasian Medical Gazette" and "The Australian Medical Journal" are incorporated.)

The Journal of the Australian Branches of the British Medical Association.

VOL. II.—8TH YEAR—NO. 17. SYDNEY: SATURDAY, OCTOBER 22, 1921. PRICE 1S.

Surgical Instruments

We are pleased to announce that good general stocks of our Surgical Instruments have arrived and that regular supplies are now coming forward. Members of the Profession are cordially invited to visit our Show Rooms.

Allen & Hanburys (Australasia) Ltd.

Instrument Makers to H.M. Army and H.M. Navy

AUSTRALASIAN BRANCH:

B.M.A. BUILDING : Elizabeth Street, Sydney

Beard Watson's Beautiful Furniture

The "MERRICK" A Diningroom of Distinction

The "Merrick" Dining-room is distinguished by restraint and simplicity of line and structure, and with a studied harmony of perfection.

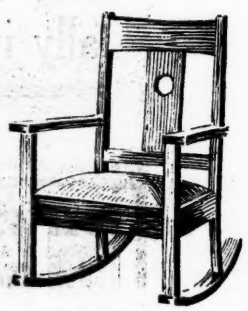
F1/173
Bureau Bookcase,
27 × 48 in., £8 5s.

The plain straight lines and quadratic forms of the "Merrick" Dining-room bid fair to surpass all our previous achievements in the direction of charm, repose and, effectiveness.

It comprises 5ft. Break front Sideboard, 4ft. 6in. Circular Extension Dining Table, 6 Small and 2 Carving Chairs. Dinner Waggon to match. Oak or Maple Fumed and Waxed.

£59/10/

Beard Watson & Co. Ltd.
GEORGE STREET. SYDNEY.



A2/153
Oak Rocker in Fabrikoid, £3 10s.

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—8TH YEAR. SYDNEY: SATURDAY, OCTOBER 22, 1921. No. 17.

Table of Contents

PAGE.

ORIGINAL ARTICLES—
The Prevention and Treatment of Pulmonary Tuberculosis, by J. Walter Browne, B.A., M.B. .. 333
The Problem of Tuberculosis, by D. R. W. Cowan, M.B., B.S. .. 341

REPORTS OF CASES—
Blood Transfusion in a Case of Puerperal Streptococcal Septicæmiá, by Sydney Crawcour, M.B., B.S. .. 347

REVIEWS—
Examination of the Chest .. 348
Suggestive Therapeutics .. 348
Electro-Culture .. 349

UNIVERSITY INTELLIGENCE—
The University of Sydney .. 349

ANALYTICAL DEPARTMENT—
Glaxo .. 350

LEADING ARTICLES—
Clinical Aids .. 351
Public Health Association .. 352

THE WEEK—
Cistern Puncture .. 353
The Leucocyte Count in Influenza .. 354
The Accessory Food Factors of Scurvy .. 354
Gland Puncture .. 355

PAGE.

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—
Ophthalmology .. 356
Laryngology and Otology .. 357

BRITISH MEDICAL ASSOCIATION NEWS—
Scientific .. 358
Medico-Political .. 358
Nominations and Elections .. 361
The War Memorial Fund in Victoria .. 361

PUBLIC HEALTH—
Annual Meeting o fthe Public Health Association of Australasia .. 361
The Plague Outbreak .. 363

CORRESPONDENCE—
Blood Transfusion .. 363
Wax Models of Skin Lesions .. 363

OBITUARY—
George Augustus Paul .. 363

PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS—
Queensland .. 364

MEDICAL APPOINTMENTS VACANT, ETC. .. 364
NOTICE TO AUTHORS .. 364
MEDICAL APPOINTMENTS: IMPORTANT NOTICE 364
DIARY FOR THE MONTH .. 364
EDITORIAL NOTICES .. 364

THE PREVENTION AND TREATMENT OF PULMONARY TUBERCULOSIS.[1]

By **J. Walter Browne, B.A., M.B.,**
Medical Superintendent, Kalyra Sanatorium, South Australia.

THE subject of this paper is the prevention and treatment of pulmonary tuberculosis and I propose to take treatment first, not as being the more important subject, but because this order of approach is for various reasons more convenient.

I propose to consider treatment more with regard to the general methods and principles used in attacking the disease, rather than treatment as applied to particular symptoms, such as cough, fever, dyspepsia and so on. I will also premise that this sketch does not pretend to be in any sense an exhaustive account of such methods and principles; to give this would take a long time and would make altogether too great demands on your time and patience.

I will take first certain accepted principles of treatment, the utility of which no one denies, which are the accepted basis of all treatment and which we might call in general routine methods: They are, as everyone knows, rest, open air and good and adequate food.

Rest.

If I had to name the most essential thing in the treatment of pulmonary tuberculosis, I would undoubtedly choose rest—rest of both body and mind.

The main problems of management are concerned in the question of how adequate rest is to be obtained. Without adequate rest, no other treatment is of any value; the question of adequate rest dominates all others. I say adequate rest, because, of course, such a thing as absolute rest is unobtainable, nor is it altogether desirable. A living body cannot remain immobile and remain healthy. Physiological play must be given to the various organs; the affected lung is only one of many organs, a very important one certainly, but no more essential than the heart or nervous system or muscular system. It is very necessary to remember that the patient has not only a body to be rested, but a mind to be occupied, interested and amused. The problem of treatment in any given case is obviously to secure the best possible balance of these different interests, interests which sometimes seem to be opposing ones and are sometimes not very easy to reconcile. And so, while it may be acknowledged that rest is the chief factor in treatment, there comes a time in every favourably progressing case when the rest

[1] Read at a meeting of the South Australian Branch of the British Medical Association on August 25, 1921.

must be modified by or associated with a certain amount of exercise. Here we meet with the first of the great bones of contention in the therapy of tuberculosis. A battle has raged for years over the questions of the relative importance and relative proper amounts of rest and exercise, which battle cannot be regarded as settled yet.

Exercise.

It will be remembered that sanatorium treatment was first successfully introduced by Walther, Brehmer and Dettweiler, in Germany, who were inclined to exaggerate the importance of exercise, that is, as compared with rest.

They were followed by Paterson, in England, who still further emphasized the importance of exercise. The exercise theory appealed specially to the exercise-loving Englishman. Further experience has led many very competent observers to doubt the wisdom of the graduated exercise system, at least as it was often carried out. It was found that while Paterson's patients in the first instance seemed to do well and were able to perform remarkable amounts of work, on leaving the sanatorium they soon broke down in health again; or many of them did. Patients who had enjoyed more rest in their treatment, seemed to stay well for a longer period.

The truth, I think, lies, as usual, between the two extremes. The exercise enthusiasts sometimes forget that rest, not exercise, is the basis of the therapy of tuberculosis; the devotees of absolute rest sometimes forget that physiological health requires movement as well as rest and that the patient has to be studied as well as the disease. My own rule in the matter is to insist on rest as nearly complete as possible at the beginning of treatment and to maintain that rest until all symptoms of activity in the foci of disease have either disappeared or are very materially modified. Once that stage is reached it is, I think, unreasonable to insist on the same amount of rest as at first, especially when it is found that a moderate amount of exercise is attended by continuous improvement in the patient. No two patients require the same amount of rest to reach the quiescent stage of disease. One will need a month; another may require six months. For this reason I regard the system which obtains in some American sanatoria of insisting on all patients taking six months' complete rest as unreasonable and unscientific. There is, I think, for every case a point in time before which any exercise is harmful and after which a certain carefully graduated amount of exercise will do good; it is the duty of the physician to note this point and act accordingly.

Open Air.

On the subject of open-air treatment much might be said. It is not, I think, denied by anyone that it is infinitely better for the patient to live in the open air than to live shut up in even the best ventilated of rooms. The question as to why open air is better than room air is not perhaps so easy to answer. Most of us, I fancy, were taught that the air in a crowded room was oppressive, because the processes of respiration exhausted the oxygen and increased the proportion of CO_2. It was also suggested that certain organic emanations from the lungs and skin had a toxic effect. We are still suffering from this hasty generalization, even though Haldane long since proved that no amount of CO_2 such as is found in living rooms, has the slightest effect on respiratory interchange. As regards the organic emanations, no such organic material has been demonstrated as present in the room air and able to produce a toxic effect.

The answer to the question has been furnished by Professor Leonard Hill and published by the Medical Research Council in England last year. Hill has moved the whole question of ventilation from the field of respiratory interchange of gases to that of skin reaction to atmospheric environment. Of the inflow of sensations which keep us active and alive, and all the organs working in their appointed functions, those from the great cutaneous field are of the highest importance. The value here given to ventilation has no relation to the chemistry of the air; the atmosphere of an overcrowded, stuffy den is all sufficient for respiratory purposes. It depends rather on the stimulus this ever-present environment gives to the skin and through it to the body it envelopes. The ceaseless variations in the rate of cooling and evaporation and the absorption of radiant energy, as in outdoor conditions, relieve us from monotony and stimulate tone and metabolism. Indoors the conditions are generally uniform, monotonous and unstimulating. His conclusion, generally stated, is that "the desirable atmosphere is characterized by being (*a*) cool rather than hot, (*b*) dry rather than damp, (*c*) diverse in its temperature in different parts and at different times, rather than uniform and monotonous and (*d*) moving rather than still."

We have here set out the whole *raison d'être* of the open-air treatment of pulmonary tuberculosis, on which we may be said to have previously stumbled almost by chance. Already this new outlook on the subject of ventilation has thrown a flood of light on such problems as the excessive prevalence of pulmonary tuberculosis in certain trades and in certain mines, such as the gold mines of South Africa. It has given an explanation of certain phenomena, such as the curious dependence of hæmoptysis on weather conditions; it helps us to understand why the climate on the sea coast is by no means so suitable for tuberculous patients as an inland climate, or the climate of the plains so good as the climate of the hills and mountains. The necessity and superlative importance of open-air treatment is an observed fact. Professor Leonard Hill's theories seem to give a perfectly adequate explanation of the fact.

Food.

The third great necessity I stated to be good and adequate food. This, of course, no one denies. Many consumptives have good appetites. The amount of food some of them can get through is almost incredible. To be exact, I should say that practically all consumptives who are improving in health, have good appetites; those on the down grade

and those whose toxæmia has not been controlled, usually have not good appetites. In early sanatorium days it was the custom practically to stuff the patients and so-called over-feeding was the rule. More sensible views have since prevailed and it is recognized that, while a patient who is improving requires and enjoys a good deal of food, there is no object to be gained in forcing him to eat more than he really requires. Dyspeptic symptoms I consider as indicating toxæmia from the active foci of disease which has not been controlled; or, if not that, then they are due to over-feeding, insufficient exercise or constipation. It is not uncommon to find that a tuberculous patient has been treated for some time for dyspepsia before the lung conditions, which were causing the dyspepsia, were noted. These are the toxæmic cases and, as a rule, the imposition of rest in the open air soon modifies or abolishes the dyspepsia. For general treatment a generous diet, with plenty of variety, is indicated.

Cod Liver Oil.

There has been a good deal of controversy on the subject of the value of certain foods, such as cod liver oil, which have been prescribed empirically, as it were, for a very long time. As occasionally happens, an empirical practice has ultimately been found to have a scientific basis. In the case of cod liver oil, the scientific basis is the fact that cod liver oil has been found to contain more vitamin—the fat-soluble variety—than any other oil. Olive oil, for instance, which is sometimes taken as a substitute for cod liver oil, contains none. I give a good deal of cod liver oil. The patients seem to gain weight on it.

Alcohol.

The difficult question of alcohol I approach with hesitation. In the sanatorium I do not allow it to be used, but I frankly admit that this rule is principally for disciplinary reasons. I do not propose to enter here on such a controversial subject. So far as I know, not many attempts have been made to solve the question of the use of alcohol in the treatment of pulmonary tuberculosis by strict scientific observations and experiments. Some time ago an enthusiastic German investigator, Professor Orth, made a large number of *post mortem* examinations on persons who had died of acute alcoholism, with the distressing result that he found them singularly free from evidences of active tuberculosis. The moral that an excessive addiction to strong liquor is a safeguard from consumption I for one do not propose to adduce. There are, of course, various possible explanations of the fact, if it be a fact.

Sanatorium Treatment.

I have now given a *résumé* of the chief principles which guide us in dealing with pulmonary tuberculosis. They are few in number, but fundamental. I wish to maintain in the most emphatic way possible that these methods and principles alone, when intelligently applied, are sufficient to bring about arrest of disease in most early cases. They can be applied anywhere, but the most convenient place to apply them in is a sanatorium, for the following reasons:

(*i.*) Most patients require a good deal of supervision, which is difficult or impossible in home treatment, easy in a sanatorium.

(*ii.*) The moral atmosphere, or what might be called the tone of the sanatorium, is helpful. The conditions of life there assist patients to avoid morbid introspection; they become less selfish.

(*iii.*) They are free from home worries and home duties. This is frequently an absolute essential to cure.

(*iv.*) In a sanatorium there are many additional interests and amusements, such as open-air games, which are possible in a community and difficult or impossible in the home-treated invalid.

(*v.*) In a disease such as tuberculosis, everything likely to brace and encourage the patient in his long and weary struggle towards health should be brought into play.

In regard to supervision, how often do we find the home-treated patient declining adequate rest because it bores him sitting still, or not getting adequate rest because his well-intentioned friends will insist on paying calls at rest hours, or recommending him to go out for a run because they are sure it will cheer him up. Or he will not take his prescribed exercise because he gets sick of the monotony of taking the same walk day after day. In the sanatorium the mere fact of the presence of other similarly conditioned patients gets over most of these difficulties. The pleasure of more or less congenial society, the spirit of emulation, the sense of a genial discipline applied to all, the mild excitements of the weekly weighings or the doctor's visit, the occasional musical evenings, the play of ordinary wholesome human interests, personal and general, all these things have their place in a well-considered scheme for the successful treatment of this disease. I admit that in the nature of things patients cannot always remain in a sanatorium until they are cured. If they are fortunate enough to reach the stage of "disease arrested" under six or eight months, well and good, but if, as so often happens, their disease is not arrested in that time, then it is usually necessary for them to move elsewhere. Even so, they have had an invaluable opportunity of acquiring some knowledge of how to continue sanatorium methods in their own homes, of how best to promote their own cure and of how to avoid risking the health of their own relatives and friends when they return to them.

I have said that, while the above described methods are applicable to all cases, they are only likely to bring about arrest of disease in the so-called early cases. Of these, a large percentage can be "arrested" and, the earlier the case, the more likely is this result to be attained.

I cannot insist too often or too strongly on the paramount necessity of early diagnosis if the patient is to have any real chance of cure. How often have we to lament that we only get the patient when his disease has already made considerable progress.

Special Methods of Treatment.

I shall now proceed to the consideration of some special methods of treatment. They are called spe-

cial, either because they are not applicable to all patients, or because their utility is not admitted by all observers. I propose to give as concise a summary of these methods as possible and shall describe them under the headings of (1) inhalation methods, (2) radiation method, (3) vaccine and chemo-therapy and (4) surgical methods.

(1) Inhalation Methods.

It has been noted for a long time that men employed in certain industries seem to be remarkably free from tuberculosis. As examples of these industries may be mentioned lime and plaster of Paris works and coal mines. It was found that SO_2 gas was generally present in the atmosphere of these works and mines and it was thought that this gas might be the inhibitory factor.

Parallel cases were the curious immunity from influenza which the workers in certain chemical factories and munition works seemed to enjoy during the great influenza epidemic of 1918. In their case the inhibitory factor was supposed to be NO_2 or chlorine. It is but a step to assume again that whatever substances have or may have the power of prevention, have or ought to have the power of curing the disease when it is already implanted in the organism. Of course, this does not follow in the least, but it was, I suppose, inevitable that such substances should be tried as cures.

Accordingly, tuberculous patients have been given inhalations of SO_2 with very varying results. Acting on optimistic reports from various sources, I have tried SO_2 gas and have not been impressed with its efficacy as a cure. It is, I think, quite capable of affecting symptoms; it can cause cough and in some cases relieve it; it can cause increased expectoration and in some cases lessen it. I do not object to my patients trying it and, if they find relief, continuing its use. As to its effect on laryngeal tuberculosis, opinions vary. I have been unable to persuade myself that it has brought about any improvement.

There are various other substances given as inhalations, mainly substances belonging to the aromatic series, such as creosote, benzoin, pine oil, eucalyptus, etc.. These have their place in treatment and I very frequently give them in varying combinations as an inhalation. I do not know how they act and I do not think for a moment that in themselves they are capable of curing, but sometimes they do relieve symptoms. They act doubtless as mild antiseptics, or they may have some alterative effect on the various germs which so frequently accompany the tubercle bacillus.

In general, then, we may consider the inhalation methods as useful in treating symptoms, useless in curing the disease.

(2) Radiation Methods.

Radiation methods, which come next in order, are easily dealt with. The rays employed in treating tuberculosis are (*a*) light rays, both sunlight and artificial, (*b*) radium, (*c*) X-rays and high frequency currents.

(*a*) Light rays have been found of very considerable utility in treating tuberculosis of glands, skin and bone. Most of us are familiar with the truly remarkable results attained by Dr. Rollier at Leysin, in Switzerland, where intensive light treatment is combined with high altitude, open air, etc.. I am sorry to say, however, that, up to the present, it has not been shown that intensive light treatment has any effect on pulmonary disease.

The same statement may be made with regard to other radiation methods. They have a field of usefulness in connexion with tuberculosis of glands, skin and bone. They have not been shown to have any effect whatever on pulmonary disease.

(3) Vaccine Therapy and Chemo-Therapy.

The subject of vaccine therapy for tuberculosis is at once the most difficult and most contentious in relation to the subject. Vaccines and sera have been used in the attempt to cure tuberculosis ever since Koch introduced the first vaccine in 1890, which he called tuberculin. Great things were expected from it and when these expected results failed to materialize, disappointment was great; for some years tuberculin fell into general disrepute. Later it was thought by many investigators that the early failures had been due to too large doses being used and the use of tuberculin was recommenced, very much smaller doses being employed.

Since that time an enormous amount of work has been done in this subject. Koch himself prepared several different forms of tuberculin and since then scores of different forms of tuberculin have been introduced by many different investigators. It was lately calculated that, up to date, upwards of two hundred different forms of tuberculin have been prepared and described. These tuberculins are vaccines, prepared from the tubercle bacillus and its toxins contained in the various culture media in which the bacillus has been grown. Various sera, immune and otherwise, are occasionally added. Intensive study has been devoted for years to the histological and chemical structure of the tubercle bacillus and enthusiastic chemists have made most elaborate analyses of the many fatty acids and waxes contained in its external envelope and the many proteins in the protoplasmic contents of the envelope. A number of these have been separated and special vaccines have been prepared from certain special chemical identities in the bacillus. There is no form of vaccine therapy which has received so much attention and occasioned so much research as tuberculosis vaccine therapy. I think I may say that there is no form of vaccine therapy which has given rise to more controversy or caused more acute difference of opinion among experts with regard to methods and results than tuberculosis vaccine therapy.

The matter of tuberculin therapy has been trenchantly dealt with by Shera in his book on "Vaccines and Sera," published in 1918. He says that what Koch claimed and what he proved are two very different matters. He claimed, quoting Koch's own words: "That in guinea-pigs, animals known to be more than ordinarily susceptible to

tuberculosis, under the influence of tuberculin, although suffering from general tuberculosis, even to a high degree, the morbid process can be brought completely to a standstill, without the body being in any way injuriously affected." This is the claim. We all know, says Shera, it has not been vindicated. I will now give in the tersest manner I possibly can an account of the experiments on which Koch based his claim. He describes first the effect of an injection of living virulent tubercle germs on the guinea-pig. The guinea-pig developes generalized tuberculosis and dies. He describes again the effect of an injection of living or dead tubercle germs on a guinea-pig which is already tuberculous. The site of inoculation, which, in the first guinea-pig, formed an ulcer which lasted until the animal died, in the second guinea-pig soon healed up and remained healed. This was, of course, an example of what we now call von Pirquet's reaction. The point which now remains and is crucial is that Koch said he observed that if small, frequently repeated doses of tubercle bacilli were injected into a tuberculous guinea-pig, not only did the animal's general condition improve, but the ulcer at the site of injection showed favourable retrogressive changes and the disease was brought to a standstill in the animal. It was, in fact, cured. Here is the definite experimental evidence in favour of the therapeutic application of tuberculin. The simple fact of the matter is that no one has yet been able to repeat Koch's experiment successfully.

There is no evidence but Koch's in favour of tuberculin as a therapeutic cure for tuberculosis in guinea-pigs, in calves or in man. No one but Koch has been able to cure an infected guinea-pig by the use of tuberculin of any sort or description. Koch, as Shera says, was an optimist. There is no question that tuberculin can do infinite harm. Scores of people have died prematurely at its hands. Never was there such a commercial vaccine as this one and never has there been such a gigantic hoax. Tuberculin, Shera says, should not come within the range of practical vaccine therapy. Whatever good results are imputed to tuberculin must have occurred in spite of it, for its virtues are founded on experiments which cannot be repeated.

Since a large number of investigators still believe in the therapeutic virtues of tuberculin or some form of it, in spite of these facts, it may, perhaps, be advisable to give a short *résumé* of the present position of theory and belief in respect to its action. When the human organism has been infected by the tubercle bacillus, which condition applies to nearly all adults in civilized countries, the skin and conjunctiva acquire the power of reacting to the application of a minute quantity of tuberculin. This is called the phenomenon of sensitization and the reaction is specific for tuberculous infection and tubercle bacillus vaccine. When a minute quantity of tuberculin is injected subcutaneously into a subject of active tuberculosis, an inflammatory reaction takes place at the foci of infection. We get what are called focal and general reactions. It was assumed and is assumed by many clinical observers that this phenomenon is also a specific one and much has been written and many theories formed concerning the *modus operandi* of the reactions. The tuberculin therapist believes that the dose of tuberculin activates the focus of disease, causing it to throw out toxins, that the response of the organism to this is an inflammatory reaction, with the concomitant formation of antibodies, which neutralize the toxins and promote healing. The action of vaccines in general has been well described as an attempt to exploit the healthy tissues in the interest of the unhealthy. The disbeliever in tuberculin therapy, while he admits the power of tuberculin to cause focal and general reactions, does not admit that its use is followed in general by improvement, at least in pulmonary disease. He maintains that, while in many early cases the administration of an exceedingly minute dose of tuberculin may not obviously damage the patient and he may even seem to improve, yet that only shows the marvellous powers of the human organism in resisting shock, and the improvement, if any, can be explained as due to other remedial measures applied to the patient at the same time. The disbeliever, too, can point to many cases where the administration of tuberculin in pulmonary disease has been undoubtedly followed by disaster and, while he freely admits the undoubted powers of the tuberculin therapist to stir up the embers and kindle the fire, he has hitherto asked him in vain for any evidence of power to extinguish the blaze.

The above-mentioned theories are those usually brought forward in discussing the evidence for and against tuberculin therapy in pulmonary disease. I venture to suggest the following additional argument against it. It is this, that the property of activating tubercular foci is not peculiar to tuberculin. The same thing can be done by quite a number of other substances, such as iodide of potash, salvarsan, morrhuate of soda, various salts of copper, gold and zinc and various extracts of the endocrine glands. When injected, these substances activate the foci of disease in apparently just the same way as tuberculin does. There is no reason for supposing that the inflammatory reactions so produced differ in any way from that produced by tuberculin. In other words, the focal and general reaction to tuberculin is not specific in the sense that the sensitization reaction is, or, at all events, only specific in the fact that an exceedingly minute quantity of tuberculin only is necessary to produce the reaction.

Tuberculin, then, must be regarded as only one of a group of substances which possess the power of activating a disease focus and which, for convenience, we might call activators; its claims to therapeutic value will be affected by the same arguments in favour and against that apply to the group to which it belongs. During the past decade an immense amount of work has been done in investigating the action of these activators, especially on the continent of Europe, and it is

this branch of the subject which is called chemo-therapy. The theory of their action is just the same as in vaccine therapy. An inflammatory reaction is produced, which it is hoped will be followed by processes of healing. The observed facts are the same. The reaction can be produced; the healing by no means always follows. As a group the activators fail to cure pulmonary tuberculosis and tuberculin is only one member, if the chief member, of the group. It is rather curious how certain metals have become associated with the treatment of certain diseases. Mercury and arsenic with syphilis; silver is supposed to appeal especially to the gonococcus, tin and manganese to the staphylococcus. In the case of tuberculosis, it is copper and gold, mostly in organic combination. Some investigators have hoped to find a method on these lines of imitating the action of salvarsan on the spirochæte, but hitherto without success. So far as I know, no chemical substance has been found bacteriotropic and bacteriolytic to the tubercle bacillus in the same way that salvarsan is to the spirochæte. These "direct action" methods have as yet no place in tuberculosis therapy and indirect action, as we might describe the action of the activators, has failed in pulmonary tuberculosis.

It is a fact that both vaccine therapy and chemo-therapy have been much more successful in glandular, bone and skin tuberculosis than in pulmonary disease, in this respect resembling treatment by the various radiations.

The usual explanation is that the lung in ordinary conditions is in constant movement, that it can never really be at rest. This may be so, or there may be other reasons connected with its histological structure or physiological functions. The facts are that, up to the present, both vaccine and chemo-therapy have largely failed to make much difference in the mortality returns for pulmonary tuberculosis. There is, I think, another explanation of the decided failure of these methods to cure pulmonary disease. I venture to bring it forward as a suggestion only and admit that, while I am unacquainted at the moment with any facts decidedly against this theory, the actual body of experimentally ascertained facts in its favour is not great.

My theory is this, that pulmonary tuberculosis, as distinguished from tuberculosis of glands, bone or skin, is at all events partially, and to a greater or less extent, a septicæmia. In pulmonary disease the bacillus can enter the circulatory system. The failure of vaccines to affect the disease in any but an adverse manner is thus explained. As we all know, vaccines have invariably been found useless, or worse than useless, in septicæmias. Now for experimental evidence in favour of this theory.

In March of this year Distaso, of University College, Cardiff, published the result of a careful and thorough experimental investigation into the presence or absence of tubercle bacilli in the blood of patients with pulmonary lesions and of patients with surgical tuberculosis, *i.e.*, with glandular and bone disease. His conclusion was that tubercle bacilli may be present in the blood of patients with pulmonary tuberculosis without pyrexia. They were found in no other type of the disease and were never by any chance found in bone and glandular disease. In so far, then, as pulmonary disease became septicæmic would it fail to respond to tuberculin. In the case of glandular, bone and skin disease there would be a possibility of the tubercular vaccine doing good; this is exactly what we find. I do not assert, of course, that all pulmonary tuberculosis is septicæmic. The disease in its earliest stages probably is not and it is at this point that many competent observers believe tuberculin can do good. I do suggest, however, that pulmonary disease has a tendency as it developes to become septicæmic and, in proportion as it does, so will it cease to react advantageously to tuberculin.

(4) Surgical Methods.

During the past two decades various surgical methods of treating pulmonary tuberculosis have been introduced. They are all, in general, simply attempts in various ways to immobilize the lung. These methods enable us in some cases to carry the great basic principle of rest one degree further; we not only rest the body and mind of the patient, but we immobilize and rest the affected lung.

The various methods used can be summed up under the following headings: (1) Artificial pneumo-thorax, (2) rib mobilization and thoracoplasty and (3) rather subsidiary methods—section of the phrenic nerve and limitation of pleural space by the insertion of a foreign substance between the parietal pleura and the chest wall.

The chief of these methods is, of course, artificial pneumo-thorax. It was first suggested, I believe, by James Carson, of Liverpool, in 1821, but not really tried until some time in the 'eighties of the last century, when a number of different men were working at it independently, in France, Italy and America. The method is in use everywhere now. It was first introduced, so far as I know, into South Australia by Dr. Reissmann in 1913 and since then a great many pneumo-thorax operations have been done by myself and other people.

I need not go into elaborate details concerning the technique of the operation. As you all know, the principle is to allow sterile air to flow into the pleural space, reducing the normal negative pressure there to zero or even making it positive, which procedure allows the elastic lung to retract until it comes to occupy a very small space indeed.

As the air is continually absorbed, it needs periodic renewals or refills. Obviously, only one lung can be done at a time and it is found as a matter of experience that the other lung, if it be reasonably healthy, can function efficiently and adequately and the patient is frequently not conscious of any limitation in his power of respiration.

There is no special method of treatment of pulmonary disease which can give on occasion such dramatic results as this one of artificial pneumo-thorax; the most unsatisfactory feature about it is the fact that it is applicable only to a very lim-

ited class. It has been estimated that, at most, not more than 10% of cases of pulmonary tuberculosis are suitable for trial of the method and, of these, not much more than half will be successes. When the success comes, however, it is apt to be a very striking one and a few such successes encourage the operator to persevere with the method. It is capable of saving patients to all appearances doomed; it will sometimes cure and, if not altogether cure, it can add years of comparative comfort and usefulness to the life of a consumptive.

I do not employ this method in early cases, until the patients have been given a fair trial on ordinary methods and have failed to respond to them. The procedure may, of course, be tried in an advanced case at any time, if the patient seems a suitable subject for the operation. I might say much more on the fascinating subject of artificial pneumo-thorax, but, remembering the limitations of your time and patience, I will refrain and just touch on the other methods of surgical treatment.

The usual cause of the failure of artificial pneumo-thorax treatment is due to the adhesions so constantly found between the visceral and parietal pleura, which will not allow the lung to retract. Various methods have been devised for separating these adhesions: They have been burnt through by a galvano-cautery inserted through a cannula, which is passed through an intercostal space. This is Jacobaens's method and is an extremely difficult one. It occurred to me that they might be separated manually and, having secured what I thought would be a suitable case, I discussed the method with our excellent President, Dr. Smeaton, who very kindly performed the operation for me. He found some adhesions which were separable, but also found, unfortunately, that the entire upper lobe of the lung was adherent to the parietal pleura and practically incorporated with it. I found afterwards that this method had been tried before by a German surgeon, who claimed one success. When all these methods fail and it still seems advisable to collapse the lung, further operations have been devised, mainly by Danish and Norwegian surgeons.

The first, rib mobilization, consists in the removal of a few centimetres of each rib about the outer border of the *erector spinæ* muscles and also of the removal of the costal cartilages in front. This allows the chest wall on the affected side to fall in. The mortality attached to this operation is severe, but some successes are claimed.

Thoracoplasty consists in the almost entire removal of the ribs on one side. The originator of this operation claims that the deformity following the operation is slight. The mortality, needless to say, is also severe.

So far, I have not been tempted to perform either of these operations. Even if one possessed the necessary surgical skill, it requires, I think, a certain temperament to perform with equanimity a series of operations with a mortality ranging from 30% to 50%.

The other operations have not often been done. The section of a phrenic nerve paralyses the diaphragm on that side and to a certain extent limits the movement of the lung. It has been tried successfully to cure a cough due to a basal adhesion.

The insertion of a foreign substance between the parietal pleura and the chest wall has been tried, in order to compress an upper lobe containing a large cavity. Substances such as paraffin, omental tissue or fibroid tissue have been used. Success has not been marked.

Prevention.

I shall endeavour to give in the fewest possible words some account of the bearing of the theories I have just discussed on the question of prevention. It is usually assumed that pulmonary tuberculosis is due to infection by the tubercle bacillus. It is usually also stated that, as the bacillus is not known to exist outside an animal body, whether human, bovine, avian or reptilian, that infection must always come from some pre-existing case.

Segregation methods are based on this idea. The theory is that, if all persons with clinically active tuberculosis could be isolated and all tuberculous cattle destroyed, human tuberculosis would disappear. It will be admitted, I think, that this is an impossible ideal, yet, even if such action could be taken, is there any reason to think that such results would follow such action? Let us study the known facts. It is known that a very large proportion of adults in any civilized community show by their reactions to the von Pirquet test that they have at some time been infected by the tubercle bacillus. They have been sensitized to tubercle bacilli and must have come in contact with the bacillus in some form at some time.

In the next place, it is found that the disease is not particularly infectious among adults. This may seem to many a rather startling statement, but when the statistics relating to infection between husbands and wives, or in sanatorium or consumptive hospital staffs, who are much exposed to infection, are studied, it will be seen that such is the case.

It is also found that the disease is very infectious among children and that when they do develope it, the mortality is high. The disease, too, is particularly virulent when introduced among races without much previous experience of it. Among such races its effect is devastating. The illness is short and intense and the patient never recovers.

To explain these various facts, it must be assumed that the almost universal infection among civilized races must confer at the same time a certain amount of immunity, which immunity is sufficiently complete to protect the vast majority of people from further attack. It is so complete, for instance, in South Australia that only one person in every thousand developes the disease each year, although the possibilities of infection are everywhere. The fact that, while the possibility of infection is wide-spread, the number of persons with active disease actually excreting tubercle germs is comparatively small, makes us sometimes wonder whether the ordinary tubercle bacillus is the only form the germ can take. It will be remembered

that, while some infections, such as small-pox or rabies, are apparently due to a so-called filterable, ultra-microscopic virus, there are others which can possibly exist in at least two forms, a recognizable bacillus and a filterable, invisible form. It is quite possible that the tubercle bacillus belongs to the latter category, for it has been found experimentally possible to communicate tuberculous infection with tissue in which it was impossible to demonstrate the presence of the tubercle germ microscopically.

We must assume again that the amount of infection available has much to do with the question as to whether the subject will succumb to this infection. Massive doses will break down resistive power which would successfully resist ordinary doses. We see too many instances of children who have been infected with tuberculosis and who are just able to carry on and no more. Their resistive power is always on the verge of breaking down. It is such children who develope the so-called strumous diathesis or phthisical stigmata, the long and narrow chest, the fine, downy hair on the skin, etc., and who are so apt to fall victims to pulmonary tuberculosis later on. We say that the disease is "latent" in these cases, which means that for a varying number of years there are no symptoms of clinical activity; but can we assume that, during these years, the infective virus is dead? Obviously not. They have been infected by a living virus and there is every reason for thinking that the virus goes on living. If still living, it is quite possible that it may occasionally, under certain conditions, be excreted.

So we reach the possibility that all infected persons, which means the majority of adults, may at times excrete a living tubercle virus, which possibility would go far to explain the universality of sensitization. I think that consideration of these facts and theories will lead any unbiassed person to doubt the possibility of eradicating tuberculosis by the segregation of persons with clinical signs only.

The advisability, too, of segregating those patients with "open" tuberculosis has been attacked, especially in France, by theorists who point out that our only protection against virulent disease, such as is seen among native races, is the immunity acquired in youth by an infection which caused no symptoms and left no signs. Without these scattered cases of clinical tuberculosis, there would be no such useful infections. If it is true, as I have tried to show, that not only clinically active cases can spread infection, then this objection falls to the ground. The clinically active cases of "open" tuberculosis are not necessary for the purpose.

The last point to which I would draw your attention is the bearing the just mentioned facts and theories have on the observed mortality rates and tuberculosis incidence rates in South Australia. While the mortality rate is everywhere falling, the incidence rate, at all events for South Australia, is approximately constant. Now, in an ordinary case of consumption, it is very seldom possible to trace the infection to someone else. It is not "caught" as we say, or very seldom, from any definite person. The constant rate of incidence, so different from that of such diseases as cerebro-spinal meningitis or anterior poliomyelitis, which are also not "caught" in the ordinary way from any definite person, points, I think, to the presence of a fairly constant mass of infected persons in the community, whose resistance breaks down on the average in a fairly constant way.

Summary.

1. We may conclude that in all probability a large number of persons will continue to develope active tuberculosis each year, owing to their natural or acquired resistance breaking down, even if every person with active tuberculosis were actually segregated on the discovery of his or her disease.

2. The segregation of all persons with clinical pulmonary tuberculosis is neither possible nor necessary. The whole aim of segregation and its only scientific justification are to avoid the possibility of massive doses. It follows then that a very great diminution of tuberculous infection, among children especially, could be effected by segregation of:

(*a*) Persons in advanced stages, when they are most infective and capable of giving massive doses which may break down anyone's resistance.

(*b*) Persons in families containing small children. Or we might adopt the French plan and segregate the children, after the so-called Grancher method. In this method the children of tubercular parents can be removed from their dangerous environment and sent into the country. The results are said to be very good.

3. We might avoid bovine infection in children—adults are not susceptible—by sterilizing milk. The dried forms of milk are possibly safer.

4. I have tried to show that a curative vaccine for all cases of pulmonary tuberculosis is somewhat unlikely to be discovered. I know of no reason why a prophylactic vaccine should not be found. Most of us have been immunized by some form of tubercular vaccine, fortuitously as it were. It should soon be possible to imitate Nature and do by design what is now done by accident.

A promising start has been made by Dr. Nathan Raw, who has subcultured tubercle bacilli for years—fourteen or fifteen, I think—until they have lost their virulence and are safe to inject into human beings. They are injected living, of course, in this way imitating Nature. Dr. Raw thinks he has proved that human and bovine bacilli are mutually exclusive, that a person infected by one kind is immune to an infection by the other. So he recommends a course of injection of the bovine form to immunize against human tuberculous infection.

Time will show whether or no these injections confer adequate protection. At least, one feels that the method is following right lines. Until an efficient prophylactic is discovered, tuberculosis, and especially pulmonary tuberculosis, will continue its ravages.

THE PROBLEM OF TUBERCULOSIS.[1]

By D. R. W. Cowan, M.B., B.S.,
Adelaide.

The question of tuberculosis is a very big and a very important one and it is manifestly impossible in a short paper of this kind to cover the whole ground. I shall not attempt to do so, but I shall deal with what I consider to be the essential and vital points of the subject and I shall try to bring conviction to your minds on those points, just as I myself have become convinced after ten years' patient study of this question.

We must admit as an outstanding fact that we have made no appreciable progress during the last fifteen years in our efforts to deal with this problem. This is one of the greatest stigmata on medicine to-day.

Tuberculosis in Children.

I will first say a few words with regard to tuberculosis in children. It is still a debatable point how much of the tuberculosis of children is caused by the tubercle bacillus of the bovine type and how much by that of the human type. It is, however, generally accepted that most, if not all, of the so-called surgical tuberculosis of children is caused by the bovine type of bacillus. I might go further and say that milk from tuberculous cows is directly responsible for most cases of surgical tuberculosis of children. There may be exceptions to this rule, but, in the main, it holds good. We must, however, bear in mind that children may be infected with the human type of bacillus and we must make every effort to prevent that infection.

Tuberculosis in cattle is a matter that requires urgent action. I would insist that the most careful examination of all dairy cows should be made; any with evident tuberculosis should be destroyed and all others should be subjected to the tuberculin test. Veterinary surgeons are content to rely absolutely on the tuberculin test in the diagnosis of tuberculosis in cattle, as they have proved to their entire satisfaction that it is a reliable test. On the strength of a tuberculin test they will order an animal to be destroyed.

It is a fact that many of our dairy cows are tuberculous and are a source of very serious danger to children who are fed on their milk. The only safe plan is to test every cow whose milk is used for human consumption. Those that do not react, are safe as far as bovine tuberculosis is concerned. Of those that react, constituting possibly 20% of the whole, there may be only 1% or 2% whose milk contains tubercle bacilli. But these few are capable of much harm and must be discovered and destroyed. Cattle have a very poor resisting power to tuberculosis; once a beast is infected, it rarely recovers and the cow whose milk is free from tubercle bacilli to-day, may give milk swarming with them in three months' time. The safest plan is to discard the milk from all cows that give a positive tuberculin test or to destroy the animals. The only other alternative is to sterilize thoroughly all milk before consumption; until this matter of bovine tuberculosis is taken in hand, I would urge everyone to do this. Retesting of dairy cows should be done at intervals.

With regard to the people who keep their own cow, all I have said before applies with even greater force; no cow should be above suspicion; every cow should be tested. I will give you details of a case that recently came under my notice, for the facts of which I can vouch. A young woman, previously quite healthy, developed tuberculosis of the lung, with tubercle bacilli in the sputum, after her first confinement. After a lot of trouble and anxiety she was apparently cured and then she had a second child. This child was always rather delicate, but presented no definite physical signs of disease. Later a third child was born and he was strong and sturdy. All this time the mother kept quite well and remains to this day apparently cured (and it is over seven years since all active symptoms subsided). The three children were apparently well and were left in charge of a good, capable nurse, while the parents went for a trip abroad. A few months after their departure the second child developed a gastro-enteritis which progressed until there was no doubt that it was a tuberculous condition; the child died within two months of tuberculous bowel trouble and meningitis. Now comes the point which I wish to impress on you. About the same time that the child's illness began their cow, a cow they had had for years and of which they had always been proud, became ill and ultimately died and at *post mortem* examination it was found to be suffering from generalized tuberculosis and tuberculosis of the mammary glands. There seems hardly any reasonable doubt that this child of a formerly tuberculous mother, which for that very reason had been carefully guarded from all sources of tubercular infection, had been infected by their own cow, which was thought to be above suspicion. This case has left an impression on my mind that I shall never forget and I hope it will leave a similar impression on yours. If we want to stamp out surgical tuberculosis in children, we must stamp out tuberculosis in dairy cows.

Tuberculosis in Adults.

Just as in children the chief cause of surgical tuberculosis is the diseased cow, so in adults the chief cause, in fact, I may say the only cause, of lung tuberculosis is the diseased human being. This fact cannot be too strongly emphasized. It is all very well to talk about insanitary conditions, poor housing, overcrowding, under-feeding, overwork, alcoholism, etc., as causes of consumption, but, after all, these are only indirect and subsidiary causes. We must bear in mind the main fact and that is, that consumption is due to the tubercle bacillus and the host of the tubercle bacillus is the diseased human being. Without the tubercle bacillus there can be no consumption, despite the worst of insanitary conditions. Do not for a minute think, gentlemen, that I would decry any of the measures of improved sanitation that common sense and a high-minded public health authority would

[1] Read at a meeting of the South Australian Branch of the British Medical Association on August 25, 1921.

impose. I heartily endorse their efforts and would urge them on to increase their scope. By this means the health of the public generally is improved and their resisting powers to the attacks of all diseases, and amongst them tuberculosis, are increased. Improved sanitation and working and living conditions generally can do nothing but good. Nevertheless, we must realize that these measures alone are ineffective in our fight against consumption. It is an outstanding fact that we have hardly progressed one iota, despite these measures, during the last fifteen years in our efforts to deal with this disease. What is the reason for this? There are two main reasons:

(*i.*) We have not sufficient control over the patient with "open" tuberculosis. We must realize that the careless or ignorant consumptive patient is the cause of the spread of this disease and we must do our utmost to remove this cause or render it inoperative. These unfortunate people are a source of infection that is capable of much harm. Many of them are not taught or will not learn the precautions that they must take to prevent them from infecting others. We must have more control over the careless consumptive. If need be, he must be shut up in an isolation hospital until he learns these precautions and the necessity for observing them. I will not touch at present on what these precautions are, except to say that any consumptive can be taught a few simple measures, which, if conscientiously carried out, will render him for all practical purposes harmless to others. I give each of my patients a printed card to remind him of these duties. I cannot urge too strongly that the sources whence arise our fresh cases of consumption are these very tubercular patients and that, before we can make any improvement in our tuberculosis statistics, we must wipe out these sources or render them innocuous.

(*ii.*) The other main reason, and this is the most important part of my paper to-night, is one that is not very creditable to the medical profession. It is our hopeless and tragic failure to detect the early case. And this brings me to the next question.

Early Diagnosis.

Almost everyone who has to deal with tuberculosis, bemoans the fact that he sees his patients too late; they have gone past the stage when he has a reasonably good chance of curing them. To my mind, this is the crux of the whole question. And though everyone realizes its importance, no one suggests a remedy. When I say early diagnosis, I mean diagnosis before definite physical signs appear in the chest and before tubercle bacilli appear in the sputum.

I admit that the only absolute proof of the presence of tuberculosis is the discovery of the tubercle bacillus in the discharges. But in the early and closed stages of tuberculosis no bacilli do appear. For the early diagnosis of tuberculosis, and especially pulmonary tuberculosis, the bacteriological examination is of very small value. It is a sad confession of want of skill to allow the diagnosis of tuberculosis to depend upon the bacteriological examination, or to wait for the discovery of tubercle bacilli in the sputum; the most favourable time for treatment will be lost, for the successful management of pulmonary tuberculosis stands or falls with early diagnosis.

These cases can and should be diagnosed before this stage occurs. How can they be diagnosed, you ask? There are no physical signs; there are no tubercle bacilli; X-rays do not help; all you have to go on are some suspicious symptoms. How can they be diagnosed? There is only one way and that is by means of the tuberculin test, in conjunction with a careful history and physical examination. Tuberculin is the most exact and finest reagent for proving the existence of a tuberculous focus in the living organism. My chief object in speaking to-night is to try to convince you of the paramount importance of this test in detecting the presence of a tuberculous lesion before sufficient damage has been done to the part attacked to cause definite physical signs to appear.

I maintain that the tuberculin test, properly used, is a safe and reliable guide to the presence of tuberculosis. I do not say it is infallible. I do not say it will always give you the information you require. Doubtful reactions do crop up that are difficult to interpret. But is any test infallible? Is the Wassermann test infallible? Do no doubtful reactions occur with it? I think they do; but would anyone in his senses deny the value of that test? I believe the tuberculin test is just as valuable in detecting the presence of tuberculosis as the Wassermann test is in detecting the presence of syphilis. I know it has its limitations and later I will try to show you what they are.

The only tuberculin test worth considering in adults is the original subcutaneous test of Koch. This is the only one that is serviceable and fertile in results. I cannot go into the details of this test here. Anyone who wishes to study the question will find all he requires fully and plainly stated in the work, "Tuberculin in Diagnosis and Treatment," by Bandelier and Roepke. Suffice it to say that the test, properly carried out, is a simple and harmless one and generally will give information of the greatest value in a doubtful case.

In considering a tuberculin reaction, there are four points to bear in mind, *viz.*:

(1) The local reaction at the site of injection—the ordinary signs of inflammation.
(2) Febrile—in general, any temperature over 37.8° C. is to be considered a reaction.
(3) Constitutional—malaise, aching pains, etc..
(4) The focal reaction at the site of disease. If this can be detected objectively or only subjectively, an active tuberculosis may be diagnosed with certainty.

A failure to obtain a tuberculin reaction excludes with certainty an active tuberculosis (except in the case of very advanced disease, when, of course, the test would not be used). A positive result indicates with certainty the presence of a tuberculous focus and even assists in a certain degree in differentiating between active and inactive disease and between recent and old deposits. Fresh and active

disease reacts promptly to a small dose and generally gives focal signs. Old changes generally only react to a large dose and frequently show a delayed reaction and no focal signs.

Indications and Contra-Indications.

The indications for the test are to make an early diagnosis in a doubtful case.

Contra-indications are (*i.*) pyrexia over 37.3° C., (*ii.*) recent hæmorrhage, (*iii.*) advanced heart or kidney disease or any other serious complication, (*iv.*) suspicion of miliary tuberculosis or tubercular meningitis.

In support of my contention that this test is of the greatest value, I will produce evidence that I think is conclusive. I will read short notes of a few illustrative cases, all of which have occurred in my own practice.

The Negative Result of the Test.

In my opinion, the value of the negative result of the test is extraordinarily great. If a person thoroughly tested with a reliable and active tuberculin fails to yield a reaction, I think that this is absolutely conclusive evidence of the absence of active tuberculosis. Some of you will say that everyone reacts. This I deny absolutely, as the notes of the following cases will show:

Case I.—Mr. G. complained of being run down and below weight. For two years he had been the sole companion and nurse of his brother, who had died about three months before of pulmonary tuberculosis. He wanted to know if he had consumption. Physical examination was negative. The result of the tuberculin test in December, 1913, was negative. He has been perfectly well ever since.

Case II.—Miss B., a telephonist, had poor health for six months. There was loss of appetite, weight and energy. During this time she had two attacks of laryngitis and had some cough and yellow expectoration. She came to know if she had consumption. Physical examination of chest did not reveal any signs. Tuberculin test did not yield a reaction in November, 1919. The diagnosis was made of simple chronic laryngitis; she recovered as soon as she left that employment. She has been quite well since.

Case III.—Mr. P. had hæmoptysis ten years before, which had recurred at intervals since. Dr. W. T. Hayward saw this man ten years ago and thought he had pulmonary tuberculosis. I saw him in 1914 and thought he had pulmonary tuberculosis, although I could find no definite lung signs. In May, 1920, I saw him again with hæmoptysis, but could find no physical signs. No tubercle bacilli could be found in the blood expectorated. Much to my surprise, he failed to give a tuberculin reaction. I knew the tuberculin was all right, because, at the same time, I tested another man with the same stuff and he gave a marked reaction. Further careful examination showed that this man had a mitral stenosis. Incidentally, I might add that this patient first drew my attention to the ease with which a case of mitral stenosis might be overlooked. In the majority of sanatoria in the United States of America the authorities will not accept a patient with hæmoptysis until tubercle bacilli have been found in the sputum or a tuberculin reaction has been obtained. They have had so many patients suffering from mitral stenosis with hæmoptysis sent in as tuberculosis patients!

Case IV.—Mr. J. S., *ætas* 17 years, has had eight attacks of pneumonia. Several doctors have told his parents that he had "weak lungs." He did not yield a tuberculin reaction in December, 1919. He has been quite well since.

Case V.—Mr. J. A., who works in a quarry, is a rather nervous man, who says he has "silicosis" and is always afraid of consumption. Physical examination did not disclose any signs. He failed to yield a tuberculin reaction in January, 1920, and has been quite well since then.

And these are all failures to react in persons reasonably suspected of being tuberculous, whose subsequent history goes to show that that fear was ungrounded. While studying these methods at Dr. Camac Wilkinson's dispensary in London in 1911, I saw a series of eight persons who failed to yield a reaction and who were contacts with tuberculous persons or suspects.

The last case illustrating a negative result that I will mention is that of:

Case VI.—Mr. T.E.D., who was sent to me from Angaston on account of suspected phthisis and who gave a history of hæmoptysis two years previously and again recently. His eldest brother and a first cousin had died of pulmonary tuberculosis. On physical examination he was found to be a big, strong, muscular man and no abnormal signs could be detected in his lungs. He had, however, a very definite epigastric pulsation, a loud second pulmonary sound and his heart was somewhat enlarged to the right side; no murmur was heard. The signs were inconclusive, but were more in favour of a mitral stenosis than of pulmonary tuberculosis. I could not make up my mind until a tuberculin test without result convinced me that he did not have pulmonary tuberculosis. The after-history of this man will be interesting and I shall endeavour to keep in touch with him.

While on this subject I must mention the necessity of being quite sure of the activity of the tuberculin being used. Recently I had the pleasure of being shown by Dr. Penfold over the Commonwealth Serum Laboratories in Melbourne and I was especially interested in the tuberculin being made there. Dr. Penfold told me that the whole of the first batch of tuberculin they made from strains of tubercle bacilli imported from abroad proved inert on physiological testing and the whole batch was destroyed. Every variety of tuberculin on the market was then tested similarly and nearly all were found to be inert. Fresh virulent strains of tubercle bacilli were then used from patients in the Melbourne hospitals and this tuberculin proved to be fully active. I am quite content now to rely on this tuberculin in diagnosis and treatment and my results have justified this confidence.

Tuberculin Reaction.

If a person presents symptoms consistent with those of an early tuberculous lesion for which no other cause can be found, and this person gives a definite reaction to tuberculin, then I say we are justified in concluding that those symptoms are caused by a tuberculous condition. If a definite focal reaction occurs, that, to my mind, is conclusive evidence of the presence of an active tubercular lesion. If these people come to us complaining of symptoms that may be caused by an early tuberculous lesion and these symptoms do not respond in a reasonable time to ordinary methods of treatment, then I say it is our duty to subject these people to a tuberculin test. We have no right to give an opinion that tuberculosis is not present, unless that opinion is backed up by the evidence of the tuberculin test.

I have notes here of several cases, all tubercular contacts and presenting symptoms consistent with those of an early tubercular infection. In all of these definite physical signs were absent and there was no sputum. They all gave positive tuberculin tests and some of them were subsequently treated with tuberculin. The results of that treatment, without any other special measure, justified the con-

clusion that they were suffering from a tuberculous affection.

CASE I.—To show that I practise what I preach, I will give you some personal history. During 1913, in the course of my practice, I came in contact with many tubercular patients. I became what you would call "run down." I was over six kilograms under my ordinary weight, was always tired and had dyspeptic symptoms. I thought I had indigestion and for three months tried all the ordinary measures without any improvement. I was not overworked and my home conditions were above reproach. A tuberculin test gave a very definite result to the first injection. I thought it was a fluke and tried again a week later, with exactly similar results. I immunized myself with tuberculin and the result of the treatment was almost immediate disappearance of all these symptoms and gain of weight to above my normal. I have never been under it since or suffered from any recurrence of symptoms. I do not say that I would not have got perfectly well without this treatment; perhaps I would, for Nature is a wonderful healer. But I do know that I have never regretted the small amount of personal inconvenience to which I was put during the immunization process, for I continued at my work and never lost a day during the six months or so of treatment.

Now, compare this history with that of the patient of Case I. referred to above, which presented almost exactly similar symptoms. Both were tubercular contacts and liable to infection. In both, physical examination was negative. Yet one failed to yield a tuberculin reaction and the other gave a reaction. One was suffering from a tuberculous toxæmia and the other was not. How could one possibly differentiate between these two without a tuberculin test?

CASE II.—The patient was a young woman, both of whose parents had died of pulmonary tuberculosis. The whole of her early history pointed to a tuberculous infection; for years she had suffered from coughs and colds and she had swallowed cod liver oil by the litre. Despite almost continuous medical attention and frequent examinations, no definite diagnosis was made until 1911, when, at the age of 24 years, she gave a marked tuberculin reaction, with focal signs in the form of cough and pain in the chest. She was treated with tuberculin with most beneficial results and is apparently well today. In this case we have proof of a tuberculous lesion in the fact that shortly after the tuberculin treatment was discontinued she coughed up, during a violent paroxysm of coughing, a small, rough, calcareous concretion, which was evidently a healed tubercular lesion that had ulcerated through into a bronchus. She has been perfectly well ever since she got rid of this concretion and no one would suspect now that she had ever suffered from tuberculosis.

CASE III.—This man gave a history of repeated attacks of dry pleurisy and frequent periods of ill-health. A tuberculin reaction with focal signs clinched the diagnosis that it was a tuberculous condition. He has been a different man since he was treated with tuberculin.

CASE IV.—This is one of my recent cases. The patient complained of severe pain which was in the region of the left kidney and ureter. On examination he was very tender and the kidney could not be felt. There was a lot of blood in the urine, but no micro-organisms of any account were found. X-ray examination showed the presence of two distinct shadows in the left kidney and the report stated that it was impossible to say from the X-ray examination whether these shadows were caused by simple calculi or by calcareous deposits in a tuberculous kidney. By this time all symptoms had subsided, his temperature was normal and the urine was free from blood. A marked reaction followed the initial test dose of tuberculin, accompanied by definite focal signs in the form of a recurrence of severe pain, with tenderness about the left kidney region and hæmaturia. I have not the slightest doubt that this man has a tuberculous left kidney.

CASE V.—A young married woman had an attack of pleurisy three years ago. For a long time after the acute attack subsided she had pains in the side, morning cough and expectoration and occasional hæmoptysis. Her weight dropped from 60 kilograms to 47 kilograms and she felt ill. She took medicine from the local doctor for twelve months without any apparent good effect. For the next twelve months she felt better, but frequently suffered from colds and cough. She married in July, 1920, and had a child in April, 1921. She was in poor health during the whole of her pregnancy and was sent to Sir Joseph Verco for an opinion. He made a careful examination of her chest about Christmas, 1920, and apparently detected nothing. Since her child was born she has not been well; she is always tired and has morning cough and expectoration. Her weight is 55 kilograms. No definite physical signs were detected in the chest, except some prolongation of expiration at one apex. She gave a marked reaction to the first injection of tuberculin. I have not the slightest doubt that this girl is suffering from pulmonary tuberculosis and, if she undergoes a tuberculin treatment now, she will be cured. Apparently even in this case a definite diagnosis was not made, as she was not even told that she should not suckle her babe. As a matter of fact, she was in such poor health a month after the confinement that she could not suckle the babe. An interesting point in connexion with this case is that her sister contracted pulmonary tuberculosis while a nurse at the Adelaide Hospital. She was treated by the late Dr. Hunn with tuberculin and made a splendid recovery and has been perfectly well for six or seven years.

I could recite many more instances in which a reaction has clinched a doubtful diagnosis, but the ones mentioned are typical of this class of case and no good purpose would be served in pursuing the subject further.

Mild and Delayed Reactions.

These generally indicate an old and healed focus. It is not always possible to decide from a tuberculin test whether a patient is suffering from active

disease or whether the result of the test is due to an old and healed focus. Judgement and experience, allied to a careful history and physical examination, will generally put the physician on the right track and few mistakes will be made. If in doubt, it is far better to say that the patient has an active disease and to treat accordingly, for no harm will be done by this treatment. On the other hand, very great harm is frequently done by overlooking an incipient trouble. I recently tested a young, active, robust man, who appeared to be in the best of physical condition. He came to be tested because his father and a sister were suffering from pulmonary tuberculosis in an "open" form and he lived in the same house with them. He gave a history of having had pleurisy while in camp on Salisbury Plain in December, 1917, and of having been in hospital for over two months at that time. But he has been in perfectly good health ever since. The result of the test was that he gave a mild reaction only after the maximum dose. I have no doubt that the pleurisy he had was of tuberculous origin, but had become cured and that the mild reaction he gave pointed to an old and healed focus. I told him he was all right, but to return for further advice if suspicious symptoms should arise at any time.

Early Diagnosis Overlooked.

Surely there is no need for me to draw attention to the frequency with which these incipient lesions are overlooked. Cases under my care at the present time illustrate quite ordinary occurrences, which, unfortunately, are the rule rather than the exception. One woman has suffered from "chronic bronchitis" for ten years and only quite recently was told she had pulmonary tuberculosis, when tubercle bacilli were found in the sputum. Practically the whole of one lung is affected and evidently it is a lesion of long standing. Her chances of recovery are very small. She has probably been an unrecognized source of infection for many years.

Another woman was ill after the birth of her second child seven years ago and was apparently suspected of pulmonary tuberculosis. She was examined repeatedly by her doctor at frequent intervals during the next few years. She was sent to Dr. J. C. Verco for an opinion, but a definite diagnosis was not made until quite recently, when tubercle bacilli were found in the sputum. Her best chance of recovery is gone. This illustrates well the only too frequent tragedy of a young person, who is keen to live, but whose chances of recovery are spoilt through failure to make a diagnosis at a stage when suitable treatment would probably have led to cure.

A third case is that of a young girl who had hæmoptysis over three years ago and has not been well since. She lives with her father, who is suffering from tuberculosis. Her doctor has made repeated examinations and told her each time she was just run down. Quite recently the diagnosis was made, when tubercle bacilli appeared in the sputum. She is doing well and will probably recover. But the diagnosis should have been made three years ago, when she could have been cured with ease and certainty.

A fourth case comes in rather a different category. This boy of 17 was a bright, intelligent lad and keen to get on. For about three weeks he suffered from a severe cold, which he could not shake off, and he felt ill. He saw his doctor four times at weekly intervals and each time was given a bottle of medicine. His chest was not examined nor his temperature taken. At the end of this time he was brought to me by his cousin, whom I had successfully treated for pulmonary tuberculosis several years ago and I tell you without exaggeration that it required less than one minute's examination of his chest to show that he was suffering from an acute tuberculous affection at one apex. The bacteriological report stated that the sputum contained very numerous tubercle bacilli. His recovery is not impossible; but if it does occur, it will be no credit to the medical practitioner whose carelessness was responsible for him walking about for a month with a high temperature. A careful history and physical examination is the first essential in diagnosis.

In concluding the subject of diagnosis, I would emphasize that the subcutaneous tuberculin test, in conjunction with a careful history and clinical examination of the patient, is the sovereign method of diagnosis for the recognition of active early lung tuberculosis in adults. The man who does not use tuberculin, will continue to make the blunders in diagnosis which are being made every day. The man who does use tuberculin in diagnosis, will avoid most, if not all, of those mistakes.

I am becoming more than ever convinced that pulmonary tuberculosis is essentially a general practitioner's disease; and I am speaking as a general practitioner. It is to the general practitioner that these patients first come, complaining generally of some vague, indefinite symptoms, the real cause of which is almost invariably overlooked for a long time. Then the practitioner begins to suspect that his patient may be tuberculous. He continues to suspect this for months and often for years, until finally, with great triumph, he discovers some tubercle bacilli in the sputum and finds that his suspicions are confirmed. In the meantime, the best chance of curing his patient is gone.

I wish to apologize to Sir Joseph Verco and Dr. Hayward for having used their names in adding point to some of my cases. I trust those gentlemen will know that I mean no disrespect. As a matter of fact, I have used their names out of respect for those gentlemen, for they are well known as men of the very highest standing in our calling, men of the highest professional attainments and probity. I mention them especially to show how futile it is for us to expect the rank and file to avoid mistakes when men like these are liable to err. These early diagnoses are impossible without tuberculin.

Treatment.

There are two main lines of treatment for pulmonary tuberculosis, *viz.*, the constitutional and the specific.

Constitutional.

This comprises all those methods that aim at increasing the natural resisting powers of the body and restoring disordered functions to their normal

state. This includes the ordinary hygienic-dietetic plan of treatment, which need not be discussed here, except to say that it should always form part of our plan of treatment of these cases when possible. And I would lay stress on the importance of studying the psychical as well as the physical condition of each patient.

A good deal of discussion usually centres about the climatic conditions most suitable to these patients; many people seem to think that climate is everything. This, of course, is quite erroneous. There is no particular climate that is especially suitable for pulmonary tuberculosis. The only climatic essentials are that the air should be reasonably pure and free from dust, smoke and micro-organisms. The climate of Adelaide and surroundings is just as good as that of any other part in the world in the treatment of pulmonary tuberculosis. Many practitioners who fail to cure their patients, blame that failure to the climate, which is hardly a fair proposition. And in this connexion I would utterly condemn the suggestion put forward by many otherwise sane men, amongst them medical practitioners, for the establishment of a sanatorium in our far north. A sanatorium "somewhere above Goyder's line of rainfall" would certainly not achieve its object. Should the patients not die of mental depression from such complete separation from all their friends and relatives, they would probably succumb from the intense heat of the summer, aided by the fly and dust nuisance. The majority of those who survive these discomforts, would not be cured of their disease, because climate alone will not cure these people. And let us not forget the experience in Western Australia. For some years they had a large public sanatorium at Coolgardie, which is in a latitude corresponding roughly with that of Hawker, in South Australia. This location was found to be unsuitable and at great expense another sanatorium was established near Perth. They shifted their sanatorium from a dry inland place at Coolgardie down to Perth, while some in our midst would have us move our sanatorium from near Adelaide to somewhere in the far northern areas. From an administrative point of view alone it is hopelessly impracticable.

Specific Treatment.

The specific treatment, by means of tuberculin, attacks directly both the tubercular toxin and the tubercular focus. Tuberculin, by stimulating the vital functions to the formation of antibodies, imitates the natural process of self-healing, which it, in fact, reinforces.

These two methods are in no way antagonistic. The general treatment of the patient must necessarily be joined with the tuberculin treatment. This combination of the two treatments is at present the most efficient means of combating active pulmonary tuberculosis. If the combination of treatments be not possible, tuberculin by itself must be used whenever it can be done. More will certainly be achieved with it than with any other method of treatment used by itself.

The tuberculin therapy of to-day is a gentle, gradual method. It involves quite small doses of tuberculin at first, to be increased only by small amounts in the course of the treatment, so that strong reactions are avoided as far as possible. The aim is to reach the greatest dose of tuberculin that the patient can deal with. It may be successfully carried out as an ambulant treatment, without hindering the patient from performing his ordinary duties, and this is an exceedingly important matter from an economic point of view.

Indications and Contra-Indications.

We may state as a guide to practice that every uncomplicated afebrile case of slight to moderate severity can be treated with tuberculin.

The specific treatment is contra-indicated in severe forms of tuberculosis with high fever and mixed infection and when other serious complications are present. The only treatment for these is complete rest in the open air. It is for this class of patient that sanatoria and other similar institutions should be reserved.

I cannot enter here into the details of the employment of tuberculin in treatment. Whoever takes up tuberculin treatment must first master the general details of the use of this valuable remedy and must have the desire and the ability to make himself familiar with the various irregularities that occur. By combining a theoretical study of the action of tuberculin with practical experience in the method of its use, we shall arrive at that safety which makes the specific treatment of pulmonary tuberculosis practicable in its widest range and full of possibilities. These methods must be taught to our students, for it is to them that we must look and hope for adequate progress in the future.

The Results of Tuberculin Treatment.

I believe that every patient with early tuberculosis before the "open" stage has been reached can be absolutely cured by means of tuberculin, frequently with no radical alteration in his ordinary mode of living and with the minimum of interference with his ordinary avocation.

As soon as the "open" stage is reached, the matter takes a graver aspect. I believe that once a patient has an "open" form of tuberculosis, with all its consequent risk of mixed infections, the chances of cure are uncertain, no matter what treatment is adopted. Undoubtedly many of these recover. I have seen some surprising results, but I think the chances are against them. This is just another indication of how imperative it is for us to diagnose these cases before this stage arrives and to treat the patients during the period when they can be cured.

In conclusion, I will give details of the case of a man who suffered for some years with an open form of phthisis and who was cured by means of tuberculin after other methods had been given a thorough trial and had failed. About 1907 or 1908 this man developed pulmonary tuberculosis, with tubercle bacilli in the sputum, after about two years of ill-health, during which the cause of his condition was not diagnosed. He owned and lived on a model farm at Smithfield at the time and was ordered to give this up. He was a man of means and for the

next four years had every attention that money could buy. He spent one winter at a station near Charlotte Waters, which is about in the centre of Australia and where the annual rainfall is only 11.25 centimetres. He returned to Adelaide no better. Then he spent a further eighteen months at Charlotte Waters, where he lived on the fat of the land at a station headquarters. Despite this, the local condition did not improve and, when he returned from there, he had very definite signs in the chest and still had tubercle bacilli in the sputum. He then came under the care of Dr. Guy Griffiths, in Sydney, in 1912. I think that even the most enthusiastic supporter of the climatic treatment would scarcely call the climate of Sydney an ideal one for phthisical persons. And yet, under tuberculin treatment and no other special measure, this man was absolutely cured in six months and remains well to this day. Despite repeated and fairly severe tuberculin reactions, he steadily improved, until he had gained nearly 20 kilograms in weight and the local condition in the lung had healed. It was with great joy he was able to throw away his sputum flask. A case like this makes us realize the utter futility of expecting to cure even a few persons with "open" tuberculosis by a four months' stay in a sanatorium at Belair or anywhere else.

I know that one case does not prove my point. But I have seen many similar to this and I am convinced that in suitable cases we have in tuberculin a remedy of the greatest value.

I thank you for the very patient hearing you have given me and I hope that at least I have given you food for thought.

Reports of Cases.

BLOOD TRANSFUSION IN A CASE OF PUERPERAL STREPTOCOCCAL SEPTICÆMIA.

By **Sydney Crawcour, M.B., B.S. (Melb.),**
Resident Surgeon, Women's Hospital, Carlton.

I AM indebted to Dr. R. H. Morrison, Senior Honorary Surgeon, Women's Hospital, for permission to publish this case.

F.R., *ætas* 26, married 5½ years, primipara, no miscarriages, of previous good health, was confined at a private hospital on April 11, 1921. The practitioner attending her writes: "The delivery was instrumental and the placenta and membranes were complete. The patient was suffering from acute bronchitis when she came in. On the second day she had a temperature of 39° C., a pulse-rate of 115 and, as there were rhonchi all over the chest, back and front, I thought that the fever was due to that. The temperature gradually came down to 37.2° C. on the fifth day, but that night she had a rigor; her temperature was 39.4° C. and pulse-rate 120. The lochia, which, up to then, had been normal, was very offensive. I gave a uterine douche and ordered vaginal douches three times a day. She was also given two doses of anti-streptococcal serum (30 c.cm. in each) on two consecutive days. Temperature has remained high and to-night reached 40.1° C.. She has complained of severe pain in the left inguinal region."

She was admitted to hospital on the morning of April 21, 1921. On examination her temperature was 40° C., her pulse-rate 140 and her respirations 28. Her face was very flushed and her tongue dry and furred, with sordes on her lips. There was slight delirium. Nothing abnormal was detected in the heart. There were some moist sounds at the bases of the lungs, but no fluid was detected. There was a marked soft distension of the abdomen. A mass was palpable in the left iliac fossa. There was marked thickening above Poupart's ligament on the left side, dull on percussion, but the dulness was not movable. There was tenderness over the inguinal regions.

A vaginal examination revealed a profuse, offensive, yellow discharge. There was a tear in the mucous membrane, extending to the perineum. In the cervix there was a slight laceration on the left side. The internal *os* was slightly open and the external *os* patulous. The uterus was firm and fixed in the horizontal position; it could be palpated just above the symphysis. There was a marked left broad ligament exudate extending from the side of the uterus to the left lateral wall of the pelvis. It was very tender and firm. Some thickening was felt in the right posterior fornix and the utero-sacral ligaments were tense.

A tentative diagnosis of puerperal septicæmia was made, a blood culture was taken and the following treatment was commenced.

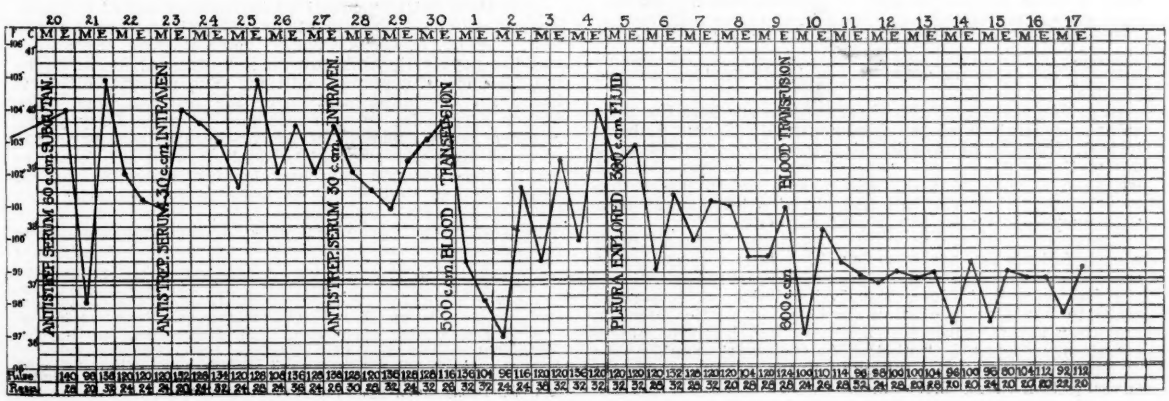
The head of the bed was elevated on blocks 45 cm. high. A desensitizing dose of 0.5 c.cm. was followed later by 60 c.cm. of anti-streptococcal serum, given subcutaneously. Strychnine (0.002 grm.) and digitalin (0.0006 grm.) were given every four hours alternately while the pulse-rate remained over 125.

Rectal enemata of saline solution with bicarbonate of soda and glucose were given every four hours.

The breasts were bound up and low pressure vaginal douches of saline solution were given twice a day.

Examination of the culture taken on admission having shown the presence of streptococci in the blood on April 22, 1921, 30 c.cm. anti-streptococcal serum were given intravenously; this was followed by a slight rigor.

The patient complained of the cough being troublesome, but there were no gross changes in the chest. Fluids were taken freely by mouth. The bowels were relaxed with


ANTISTREP. SERUM 60 c.cm. SUBCUTAN.
ANTISTREP. SERUM 30 c.cm. INTRAVEN.
ANTISTREP. SERUM 30 c.cm. INTRAVEN.
500 c.cm. BLOOD TRANSFUSION
PLEURA EXPLORED 2500 c.cm. FLUID
600 c.cm. BLOOD TRANSFUSION

fluid stool and rectal saline enemata were not retained. There was slight incontinence of urine.

In spite of a further dose of 30 c.cm. of anti-streptococcal serum, given on April 27, the patient's condition became progressively worse. At first she retained some of the rectal saline enemata, but eventually she had complete incontinence of both fæces and urine.

Ten days after injection of serum the patient developed a well-marked rash of urticarial character, probably due to the serum. Her abdomen was very distended; she vomited green fluid. Very little urine was being secreted; the amount could not be estimated, owing to incontinence. She shouted out in sleep. There was marked œdema of the vulva and of the extremities. She refused to take nourishment.

On estimating the blood, I found a red cell count of 3,400,000 per c.cm. and hæmoglobin 40% and decided to give a blood transfusion. On typing her blood, I found her to be a Type IV. and a suitable donor of similar type was obtained.

On May 1, the twentieth day of the puerperium, I transfused 500 c.cm. of blood. This was followed by a severe rigor, lasting about forty minutes. The respiration became rapid, pulse weak and about 160. Oxygen was administered and brandy given and the patient quickly picked up. Six hours later the temperature was 36.7° C., the pulse-rate 96 and the respirations 24. The patient's mental condition now improved and she took fluids by mouth. Sphincter control improved, although she still was unable to retain rectal saline injections and the abdominal distension and œdema became less marked.

As the cough was still troublesome and examination revealed fluid in the right side of the chest, I aspirated the chest on May 5 and withdrew 240 c.cm. of blood-stained fluid. The fluid proved to be sterile.

On May 6 the patient was disinclined for nourishment, restless and rubbing her face and nose; at 2.30 a.m. she had a fit lasting 60 seconds. There was twitching of the body, face and limbs and frothing at the mouth. The urine was clear and its reaction neutral. It contined no albumin, sugar, acetone, nor diacetic acid. The specific gravity was 1015.

Her condition continued to improve and on May 9, her hæmoglobin being 39%, I gave her a second transfusion of 600 c.cm., which was followed by a rigor lasting about thirty minutes, but without the reaction exhibited on the previous occasions. Twelve hours afterwards the patient's temperature was 37.3° C., her pulse-rate 112 and her respirations 24.

From this time onwards the patient made an uninterrupted recovery; the temperature did not again become elevated above 37.2° C.. No organism was cultivated from the blood in an attempt made after the second transfusion. More frequent cultural control of the blood was impossible, owing to the bad state of the patient's arms.

Conclusions.

The marked improvement following a blood transfusion shown in the general condition of a patient suffering from puerperal streptococcal septicæmia, who ultimately died from general peritonitis and broncho-pneumonia, encouraged me to employ this treatment in the case reported.

The method of transfusion adopted was the "citrated method," as my experience in nearly fifty cases has shown this to be quite reliable, in contra-distinction to the paraffin tube method.

In giving anti-streptococcal serum (we use here the polyvalent preparation of the Commonwealth Serum Laboratories), I prefer to give it intravenously, succedeed by a desensitizing dose of 0.5 c.cm. of serum, in doses of not less than 30 c.cm., as in this way a rapid and intense action is obtained. It is painless and obviates the danger of a subsequent abscess at the site of injection.

I have seen only one severe case of anaphylaxis, although a rash follows the use of serum in a large percentage of cases.

I feel sure that blood transfusion holds an important place in our armamentarium in cases of septic infection and from several cases which I have had lately of *hyperemesis gravidarum* I think that further work would prove of value. I hope later to publish the result of further investigation along these lines.

Reviews.

EXAMINATION OF THE CHEST.

Drs. E. M. Brockbank and Albert Ramsbottom, of Manchester, have written a small volume on the clinical examination of diseases of the lungs, which is intended to meet the difficulties which students have in understanding clearly the various physical signs of pulmonary disease.[1]

The book begins with a statement of certain anatomical and physiological considerations which lie at the basis of chest examination. In the next place, the subjective symptoms and objective signs met with in diseases of the lungs are described and the methods and results of inspection, palpation, percussion and auscultation are detailed. Finally, a brief summary of the physical signs of common pulmonary diseases is appended.

As is to be expected in a work which gives the outlines of the authors' teaching to students, the general tone is dogmatic rather than controversial; but there is little to cavil at in the statements made. Rather too much importance seems to be laid in the section on dyspnœa on thrombosis of the pulmonary artery as a cause of dyspnœa and death; embolism of the pulmonary artery is referred to as giving rise to symptoms of acute pleurisy and pneumonia of sudden onset. The general teaching seems to be that pulmonary embolism, as a result of venous thrombosis in post-operative cases and in diseases such as enteric fever and influenza, is a much more frequent cause of these dyspnœic conditions.

Although hydatid of the lung is referred to, the possibility of this disease causing hæmoptysis, a not uncommon occurrence in Australia, is not mentioned.

As an example of the authors' teaching may be mentioned the insistence on bronchial breathing and increased vocal fremitus as signs of pleuritic effusion when the bronchial tubes are left open, whereas in massive consolidation of the lung involving the air passages diminished vesicular murmur, vocal fremitus and resonance are to be expected. Inattention to these facts is a frequent cause of difficulty in the diagnosis of massive consolidation and pleuritic effusion.

The somewhat difficult question for both student and practitioner of the classification of the so-called moist and dry adventitious auscultatory signs is simplified by the authors. They divide sounds into (*a*) moist, which are either rhonchus (wheeze) or râle (bubble), and (*b*) dry, either crepitation, alveolar in origin, and friction rub, pleuritic in origin. In doing so they mention the difficulty of distinguishing between râles and coarse crepitations, which they say may be minimized by taking into account the other direct symptoms and physical signs.

On the whole, the book may be said to be one that satisfactorily fulfils its object and may be recommended as a reliable guide to students, practitioners and teachers.

SUGGESTIVE THERAPEUTICS.

It is some thirty years since the publication of the well-known volume, "Treatment by Hypnotism and Suggestion,"[2] by Dr. C. Lloyd Tuckey, made its first appearance and the popularity this volume has attained is shown by the presence of a seventh edition. The present edition is based for the most part upon the previous one. The author lays claim to an experience of some forty years' practice as an exponent of psycho-therapy, mainly in the form of hypnotic suggestion, dealing with all forms of bodily disorders and neuroses; he has apparently had no reason during that period to vary in any material way his methods or his technique.

Several of the earlier chapters in this book are chiefly

[1] "The Clinical Examination of Diseases of the Lungs," by E. M. Brockbank, M.D., F.R.C.P.; and Albert Ramsbottom, M.D., F.R.C.P.; 1921. London: H. K. Lewis & Company, Limited; Crown 8vo., pp. 58, with 13 illustrations. Price: 4s 6d. net.

[2] "Treatment by Hypnotism and Suggestion, or Psycho-Therapeutics," by C. Lloyd Tuckey, M.D.; Seventh Edition; with a Chapter on Treatment by Suggestion During the War, by A. Percy Allan, M.D., B.S.; 1921. London: Baillière, Tindall & Cox; Demy 8vo., pp. 413. Price: 21s. net.

concerned with an elaborate and interesting description of the influence of mind over matter and the inter-relationship between mental and bodily functions.

A strong plea is made by the author to eliminate the practice of hypnotic treatment from the hands of the layman. With this neurologists and psychiatrists will agree.

The book contains such an enormous amount of illustrative cases, anecdotes and stories, either experiences of the author or of other observers, that the reader is bewildered and wonders if there is any mental, moral or physical abnormality that has been omitted in the successful treatment by hypnosis.

Chapter VI. relates the various theories and explanations of the phenomena of the hypnotic state, but Dr. Tuckey does not commit himself to any view and leaves the unravelling of the mysteries to the research workers of the future. The opinions and hypotheses of alienists and psychologists in various parts of the world are interestingly recorded and many useful hints in the treatment of cases are added.

In succeeding chapters the writer returns to theories interspersed with descriptive cases and statistics. Chapter X. is devoted to a quotation of 34 cases (with several super-added), each of a different type, treated by the author himself, in which somewhat more detail is permitted than in the previous pages; but there is a considerably brevity and meagreness of evidence which renders them less convincing to the reader than would otherwise have been the case.

A chapter on treatment by suggestion during the war by Dr. A. Percy Allan has been interpolated. It is brief and disappointing and appears to be mainly a eulogy of the work of Dr. Hurst at Seale Hayne.

The book might be advantageously rearranged by a better grouping of the matters dealt with and the avoidance of a somewhat monotonous repetition. It is, however, very interesting and instructive and may be recommended to those desiring information concerning psychotherapy and the wide field to which it is alleged to be applicable.

ELECTROCULTURE.

In his book on "Electroculture,"[1] Mr. A. Carr Bennett embodies the results of experimenets carried on for the past nine years on the application of electricity to seeds in vegetable growing. He claims that successful market gardening depends more on the health and vigour of the seed, which electroculture is said to stimulate, and on regular watering than on the quality of the soil. This may be true of virgin soil, in which the ordinary garden crops will grow luxuriantly, but it is hardly the case in comparatively poor land which has been cropped heavily for several years in succession. The apparatus required is simple, being an ordinary 7.5 cm. medical induction coil. The seed is thoroughly soaked in water, spread out thinly between two layers of cloth and placed on an insulated metal footplate, which is connected with the one terminal, the current being applied by brushing the other electrode lightly and evenly over the surface of the cloth. A table is given, showing the length of time needed for soaking the seed and applying current, as well as the strength of current to employ for each variety of seed. The author states that his numerous experiments show that the electrified seed germinates better and more quickly, gives more vigorous plants, which yield their crop sooner and in larger quantity, thus saving valuable time where intense culture is employed and several crops are grown in the same ground in the one year.

The book's value is enhanced by thirty-two good illustrations, showing the apparatus used, the methods of employing it and the results obtained. Unfortunately, although control crops were always grown, no illustration is given showing the contrast between the electrified and untreated crops. We have to take the author's assurance for it in every case. In America various methods of applying electricity to seeds and growing crops have been tried with varying results; sometimes they are brilliant; at other times, under apparently similar conditions, failure has been recorded. To sum up, Mr. Carr Bennett's method is only applicable to seeds that are to be planted immediately, as once seeds are thoroughly wetted their keeping power is greatly diminished, or if they survive, the electrical stimulation cannot conceivably last long. It would be impossible for large wholesale seed merchants to treat their seeds in this way, as they could not rely on their fertility if kept for any time.

[1] "Electroculture: The Application of Electricity to Seeds in Vegetable Growing," by A. Carr Bennett; 1921. Sydney: Angus & Robertson, Ltd.; Crown 8vo., pp. 118, with 32 illustrations. Price: 5s. net.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A meeting of the Senate of the University of Sydney was held on October 10, 1921.

The degree of Master of Surgery (Ch.M.) was conferred *in absentia* on Messrs. J. R. McLean, M.B., E. W. Rivett, M.B., and F. S. Thomas, M.B..

The following appointments were made:

Dr. Harold Ritchie as Medical Tutor, Sydney Hospital, in place of Dr. Hamilton Marshall, who has now become Senior Honorary Physician at that hospital.

Senate Representatives on the Board of the University Union: Acting Professor Lancelot Harrison, B.A., B.Sc.; Professor E. R. Holme, M.A..

Senate Representatives on the Board of the University Women's Union: Dr. Constance D'Arcy; Dr. Marjorie Little.

A letter was received from the Perpetual Trustee Company, Limited, the executor of the will of the late Colonel Walter Oswald Watt, who died on May 23, 1921, announcing the bequest of the testator of his residuary estate upon trust for such uses as the Senate in its absolute discretion shall determine. It was decided that a letter of thanks and appreciation be sent to the company.

The Senate accepted the loan of the Trustees of the National Art Gallery of the portrait of Sir Thomas Anderson-Stuart by Mr. John Longstaff. It was decided that the portrait should be hung in the Medical School, at the entrance to the Physiological Department.

The following recommendations of the Professorial Board were adopted:

(1) That after March, 1921, all candidates for matriculation be required to pass at the higher standard in English.

(2) That all candidates for matriculation be required to pass at the higher standard in a language other than English.

(3) That the By-laws be amended accordingly, *i.e.*, that the fourth paragraph of Section 5, Chapter XX., read as follows: "Candidates must pass at the higher standard in three subjects, of which (*a*) one must be English and (*b*) one must be Latin, Greek, French, German or Japanese."

The Senate also adopted recommendations of the Faculty of Medicine:

(1) That the amount of the Parkinson Memorial Prize for Pathology be increased from £5 to £10.

(2) That a programme of post-graduate courses in medicine, arranged by a sub-committee of the New South Wales Branch of the British Medical Association and approved by the Council and Faculty, be referred to the University Extension Board for the purpose of carrying out the necessary details.

Mr. Bernard Muscio, M.A., of Cambridge, was appointed to the Challis Chair of Philosophy.

The Challis Chair of Philosophy becomes vacant at the end of the year, upon the retirement of Professor F. Anderson. Applications were invited in the United Kingdom and Australia and the choice of the English committee was confirmed by the local committee and a recommendation made to the Senate in favour of Mr. Muscio.

The Senate expressed itself gratified that the choice of the English committee should have been that of a graduate from the Sydney University.

Analytical Department.

"GLAXO."

IT has been determined before any investigations into the preparation of dried milks were undertaken by the experts acting for THE MEDICAL JOURNAL OF AUSTRALIA that three requirements should be satisfied. The first is that the product shall be prepared from pure milk, complying with the provisions of the Pure Foods standards of the State in which it is prepared, except in regard to the fat content. The second requirement is that no extraneous ingredient shall be added. The third is that scrupulous cleanliness shall be observed in all parts of the process.

Our inspector visited the factory of Joseph Nathan & Company, Limited, at Port Fairy, in the western district of Victoria. He also inspected a farm from which milk is being supplied to the factory. Finally, he visited the packing room of Joseph Nathan & Company, Limited, in Melbourne.

The Factory.

The factory is a new building, having been erected about one year ago. It is situated on the outskirts of the country town of Port Fairy, in the centre of a rich dairying district. It is of attractive design. The buildings stand back from the road and a garden has been laid out. The proprietors make use of the precepts of the "welfare" movement and trust that the artistic and neat surroundings will assist in maintaining a high standard of efficiency in the treatment of the milk.

The factory is arranged in such a manner that the various processes can be employed in succession with a minimum amount of transport. All parts are well lighted. The floors are composed of cement. They are properly levelled and are provided with efficient drainage. The cement is free from cracks. The whole building was scrupulously clean at the time of the inspection. The floor around the milk vats and machines was free from spilled milk and was dry. All the vats, pipes and machines were not only clean, but bright and well kept. The conditions were everywhere those of a model equipment.

Control Measures.

A well-furnished chemical laboratory is present and the whole process of manufacture is subject to chemical control. The analytical work is laid out to provide routine analyses of the milk received at the factory, continuous records of the milk in the vats and periodic tests of the dried product from the machines. In this way the whole procedure of manufacture is carried out as a result of the figures obtained by the chemist; the final tests are accepted as the evidence that the initial figures have been properly used to control the process. The technical work in this laboratory is worthy of commendation on account of its high standard.

The Process.

The milk is collected from the depôts and farms and brought in motor lorries to the factory in metal cans. These cans are designed in such a manner that they can be easily cleaned. The milk in each can is examined. Samples are taken on arrival. They are tested in respect to acidity, fat content and specific gravity. When the acidity is above an arbitrarily fixed figure, the milk is rejected. The proprietors place importance on the test for acidity in judging samples.

The milk is first poured into the weighing machine and is then strained and cooled to approximately 10° C.. A refrigerating plant has been installed to effect the necessary cooling. The milk, after it has been cooled, is passed into vats, in which it is kept in constant motion by mechanical means. Complete records are kept for each vat. These records have been examined by our inspector and he has found that the uniformity of the figures bears testimony to the accuracy of the control. On June 8, 1921, vat No. 2 contained 4,082 kilograms of milk. It was filled at 10.35 a.m. with milk at a temperature of 11.1° C.. It had a density of 1031.8; its butter fat was estimated at 3.48% and its acidity at 9.5 c.cm. decinormal alkali for 50 c.cm. of milk. After it had been standardized, the butter fat was determined as 3.67%. A certain quantity of sodium bicarbonate was added and nearly 57 kilograms of lactose. At 11.30 a.m. the contents were run off to the drying rolls, the temperature then being 11.6° C.. The tests from the drying room gave a dried product with 2.38% of moisture and 26.65% of butter fat (Werner-Schmidt).

After adjustment of its composition the milk passes to the drying rolls. The drying is effected rapidly. It then assumed the form of a sheet of material containing about 2% of moisture. The fragments of this sheet are passed through a machine provided with a brush and sieves. In this way a finely powdered product is obtained.

The powder is packed at the factory into tins, each containing 22.7 kilograms. The tins are soldered. Samples of the product as it left the hot rollers and of the material placed in the large tins were collected by the inspector in sterile cans under sterile conditions.

Packing.

The dried milk is packed by women into the tins for retail sale after being placed in paper bags. The women wear overalls and wash their hands before starting work. The whole of this operation, as witnessed, was carried out under conditions insuring the absence of dust.

Analyses.

Samples of "Glaxo" were purchased in the open market and were subjected to careful analysis. The following figures are selected as representative of the composition of the material:

Moisture	3.1
Fat	26.2
Lactose	42.1
Protein	23.1
Ash	5.6

These figures are the result of direct determinations. If the powder be made up as directed, with eight parts of water, the fluid contains:

Fat	3.3%
Lactose	5.2%
Protein	2.7%
Ash	0.7%
Water	88.1%

Solubility tests are carried out on the product at the factory as a check against undue heating during desiccation.

A series of tests has been made on the number of bacteria present in "Glaxo." Samples, as stated above, were taken at the rollers and at the sifters. A small sample was also taken in the shape of a closed tin at the packing room in Melbourne. A test was also carried out on the purchased sample. The enumeration of colonies yielded the following result:

One gramme of "Glaxo" leaving the rollers, 1,200 colonies.
One gramme of "Glaxo" leaving the sifters, 1,270 colonies.
One gramme of "Glaxo" after packing, 1,700 colonies.
One gramme of "Glaxo" after standing (weeks), 1,550 colonies.

No organisms of the colon group and no pus-forming bacteria were detected. These figures show that the "milk" made from "Glaxo" contains far fewer organisms than the best dairy milk. The process of manufacture effects a considerable degree of sterilization.

At a farm from which milk is supplied regularly to the factory, it was seen that the conditions were satisfactory.

Conclusions.

"Glaxo" is a dried milk with added lactose. Its fat content is brought to a standard by the addition or abstraction of cream. The "solids not fat" are brought to a uniform figure by the addition of a varying quantity of lactose. The milk is always fresh and of low acidity.

From the foregoing it is evident that "Glaxo" is a reliable milk preparation of nutrient value equal to fresh milk, with fewer bacteria and of guaranteed sweetness. We would emphasize the fact that "Glaxo" cannot replace mother's milk in the feeding of infants, any more than fresh cow's milk or any other milk preparation can. But for children and adults it is obviously a very valuable product. The claims made for "Glaxo" by its producers are justified.

The Medical Journal of Australia

SATURDAY, OCTOBER 22, 1921.

Clinical Aids.

Medical practice of to-day is, or should be, a compromise. The views still held by the survivors of the schools of the latter half of last century are no longer tenable. These practitioners relied on experience and an innate ability to observe rapidly and correctly to guide them through the difficulties of practice. They often acquired a wonderful power of intuitive diagnosis and an extraordinary ability to access the true value of physical signs. Up to a certain point they were able to differentiate correctly between known diseases, but the failure became apparent when progress in pathology and ætiology revealed physico-chemical changes of a nature formerly unsuspected. These old-time doctors frankly admitted that they had no belief in the new-fashioned fads of the laboratory as aids to diagnosis. The ultra-modern laboratory technician stands in an even more unreliable position. With a far from perfect equipment in chemical and physical knowledge and a training largely based on partially proven doctrines, he would discount clinical evidence and clinical impressions altogether and seek the differential diagnosis in the test-tube or under the microscope. The future may evolve a species of super-pathologist, who will be able to label every disease of human patients from an examination of some tissue or tissue fluid removed for the purpose to the laboratory. At the present time this phenomenon does not exist.

The safe, scientific medical practitioner should seek a middle course and endeavour to define the extent of the compromise. In his relations to his patient his chief aim is to cure disease. It is for this that he is paid and it is for this that he receives his ante- and post-graduate training. That there is scant economy in trying to cure disease, instead of preventing it, is not his fault. When the world discovers the futility of this arrangement, medical practitioners will have to alter their outlook and mode of procedure. For the present there is no escape from the anomaly. To-day the wise physician realizes that his ability to help his patient will be proportionate to the exactness of his diagnosis. He must use his five senses at the bedside. Perhaps he will find the intuition or instinct of his forefathers a very valuable aid, if properly safeguarded by check tests. On the other hand, he cannot afford to ignore the lessons derived from the laboratory. He must utilize many of the modern diagnostic tests and some of the methods provided by physiologists for the detection of disturbances of normal function. Discussion is taking place in our midst concerning the clinical value of certain somewhat complicated reactions in diseased states. The general practitioner is obviously unable to perform these tests himself, partly because they need extensive experience and well-developed laboratory skill and partly because they are time-robbing procedures which demand the uninterrupted attention of the worker. In order that the proper evaluation of the results of these tests may be reached, the general practitioner should send with the blood, serum or cerebro-spinal fluid a full account of the clinical manifestations of the illness, a history of the illness and of health of the near relatives of the patient and all other information that may influence the pathologist in judging the significance of the laboratory findings. The latter will then be in a position to advise the attending practitioner whether there is anything to be learned from the application of these tests concerning the diagnosis. In the public interest clinical laboratories for the performance of these tests by experts should be within reach of every practitioner in the Commonwealth. The Director-General of Health for the Commonwealth has recently announced that the provision of laboratories in country districts for this purpose has been included in his programme. The Federal Treasurer will be well advised if he makes a sufficient amount of money available to enable the Director-General to carry out this experiment. We have confidence in the profession enough to predict that full use would be made of these facilities.

Apart from the intricate tests, which must be left to the specialists, there are many other clinical aids

to diagnosis which are often neglected without justification. The up-to-date practitioner should establish a small laboratory of his own, in which he could carry out many very valuable investigations. The examination of the blood is an undertaking well within the power of the busy practitioner. A red and white cell count can be completed with ease, either at the bedside or in the laboratory "while the patient waits." The differential count can be made at the end of the day's work or when spare time can be found. The general practitioner should endeavour to identify infecting bacteria in the sputum, urine or other fluids of the body. Many doctors in busy practice have installed a simple bacteriological equipment, including an incubator. They have found that the inoculating of culture tubes or plates is merely a matter of a little practice. The preparation of films from cultures is not a lengthy process and the identification can be effected in many cases without further elaborate sub-culturing in media containing the various sugars. An uncomplicated equipment will suffice for the adequate chemical examination of the urine, gastric contents and fæces. Much useful information can be elicited from properly conducted chemical tests, which the usual casual testing of urine will not reveal.

In the last place, the modern practitioner should not regard his work complete unless a pathological examination of every tissue removed from a patient has been carried out by a competent pathologist. The judicious and proper use of clinical aids to diagnosis is an obligation that the practitioner of to-day owes to his patient and to himself.

THE PUBLIC HEALTH ASSOCIATION.

In this issue we publish a short record of the first annual conference of the Public Health Association of Australasia. Sufficient detail is given to enable the reader to recognize the scope of this new organization and to stimulate him to step in and join in the endeavour to do something real for the improvement of the health of the community. The Public Health Association of Australasia is a promising, lusty infant, just one year of age. Its cries are already heard in every State of the Commonwealth and the attention and fondling this baby is receiving from its "uncles and aunts" in all parts are considerable. In South Australia the membership is already large; in other States progress is being made. The success attending the first meeting is an earnest of the importance this society will gain in the Australian world of hygiene in the near future.

The medical profession as a whole has a deep concern in the programmes of investigation and research which have been drawn up. It will be noted that experts in several branches of medical practice have associated themselves with the committees in the several States, in order that questions, such as infant and child welfare, the prevention of tuberculosis, the standardization of the Wassermann test and so on, may be approached from the clinical and pathological as well as from the administrative side. Outside the medical profession valuable information bearing on many problems in hygiene can be gathered. The Public Health Association opens its doors to all serious workers in hygiene and preventive medicine, so that every assistance may be gained and the progress may be rapid and well founded. We appeal particularly to the well-informed medical practitioner to join the Association during the early stages. A large membership of medical practitioners engaged in ordinary and special practice will have a salutary effect, for two reasons. In the first place, it would expedite the recognition on the part of the medical profession as a whole of the need for the introduction of preventive medicine as the most important function of the doctor. The awakening of the public interest in health matters can be effected without difficulty by the doctors in attendance on the sick section of the community. The doctor holds the key to the situation as far as education is concerned in the palm of his hand. His membership of the new organization is therefore eminently desirable. The second reason is that a majority of practising doctors would act as a steadying influence on the departmental medical members and on the non-medical members. The departmental medical members are so accustomed to mould their procedure and actions in accordance with the legal enactments which they have to administer, that new conceptions and revolutionary proposals are liable to be brushed aside as impossible before they have

been thoroughly scrutinized. With keenness and familiarity with the conditions of health in the home as their stock-in-trade, the practising medical members should be in a position to bring strength and vigour into the endeavour. Moreover, in the final application of all sound measures of prevention of disease the general practitioner must be the most important link between the governmental authority and the public. If the medical profession responds well and widely to the invitation to join this undertaking, the Public Health Association of Australasia may prove to be the means of setting preventive medicine on a firm basis in the Commonwealth.

CISTERN PUNCTURE.

The removal of cerebro-spinal fluid by means of trocar and cannula from the lumbar region of the spine has become a common procedure during the last decade. At first suggested and practised by Quincke as a therapeutic measure for the relief of increased intra-cranial tension, it has in latter years been employed more for its diagnostic value. The microscopical and chemical examination of the cerebro-spinal fluid has been found to yield important information concerning the pathological condition of the central nervous system. Little, however, has been added to the general knowledge of lumbar puncture by the successors of Quincke. That astute physician has left to us a monograph of singular completeness. If he is rightly termed the first authority on lumbar puncture, he may with equal justice be called the last. The tendency to-day is to resort more and more to the therapeutic use of lumbar puncture, on which the physician of Kiel insisted with such emphasis. During the epidemic of cerebro-spinal fever which attacked the soldiers of our military camps in 1915 and 1916, clinicians resorted to frequent paracentesis of the spinal canal as one of the few means of treatment which held out any hope of recovery from that terrible disease. Daily puncture was the rule and in the very acute stages the operation was frequently repeated at six-hourly intervals or the needle was left to drain continuously. Those who were privileged to treat the victims of that epidemic, will recall vividly the sufferings to which their patients were subjected. The daily routine of puncture and drainage became almost unbearable. Doctor and patient were alike distressed by this never-ending, but apparently necessary, form of treatment. The only feature which gave hope, was the successful withdrawal of large quantities of turbid or clear fluid. The fear of a "dry tap" became almost an obsession, for it was the common knowledge of the patients that a rapid decrease of the amount of fluid obtained was usually a sinister sign. One day the dreaded "dry tap" would be obtained, the patient's temperature would rise, signs of meningism would become more pronounced and coma and death would supervene. Occasionally these changes meant the onset of hydrocephalus; more frequently they meant a failure of the chorioid plexuses to secrete fluid into the ventricles. The whole cerebro-spinal system became parched as by a drought. Hope that insertion of the needle at a higher level in the spine would draw fluid, led to an abandonment of the lumbar region of puncture. The dorsal and even the cervical regions were tapped in what proved only too often to be a vain hope. It was felt, however, that in a few cases relief might be obtained by removal of fluid from the large cisterns at the base of the brain, especially in those instances in which adhesions of the meninges in the upper portion of the spine appeared to have dammed back the fluid into the cranium. The suggestion was made by Professor J. T. Wilson, of the University of Sydney, that puncture through the *foramen magnum* was a practicable and, with reasonable care, a safe procedure. So far as we know, no clinician had sufficient temerity to attempt this operation. Recently, however, descriptions of "cistern puncture," notably by Ayer, of Boston, have appeared in American contemporary journals. The most recent contribution to the subject has been made by Dr. Henry McCusker.[1] He has performed cistern puncture on nine patients forty-five times in all. His method is closely similar to that of Ayer. The needle is introduced into the back of the neck in the depression which lies between the external occipital protuberance and the spine of the axis. The needle is carefully advanced forwards and upwards through the posterior occipito-atlantoid ligament and *dura mater* into the *cisterna magna*, whence fluid may be drained. It is emphasized that the needle should never be inserted more than five centimetres, lest injury be done to the medulla. Dr. McCusker observed no ill-effects in his series of 45 punctures. No injury was done to the delicate tissue of the medulla and no deaths or untoward manifestations occurred. He speaks enthusiastically of the virtues of the operation, proudly contrasting it with lumbar puncture. No resultant headaches, no root pains in the limbs, no soreness of the neck or back and no discomfort! Dr. McCusker would apparently abandon lumbar for nuchal puncture. Nine patients and no death are a good recommendation, but they are no guarantee of the safety of the procedure. Possibly the personal equation of the surgeon is the important factor. A steady, gentle hand and good technique make the operation safe, but it is terrible to dwell on the consequences of a tearing up of the medullary substance by a needle clumsily driven. The principle of "safety first" should apply to surgery equally as to industry. Lumbar puncture, carried out slowly and cautiously, has been held to be a reasonably safe operation. But even lumbar puncture has its risks. All clinicians are cognizant of the danger of sudden death when lumbar puncture is performed on patients suffering from new growths of the brain and recently in The Medical Journal of Australia Dr. Reginald Webster, of Melbourne, has furnished strong experimental evi-

[1] *The Journal of Nervous and Mental Disease*, June, 1921.

dence to prove that meningitis is a possible danger of lumbar puncture, especially when the patient is suffering from a blood infection. But if lumbar puncture is to be performed with due circumspection, the introduction of a needle into the *foramen magnum* should only be attempted after the most careful deliberation. Cistern puncture has yet to be justified by results. As a desperate expedient in cases of communicating hydrocephalus and cerebrospinal meningitis it may, however, find acceptance.

THE LEUCOCYTE COUNT IN INFLUENZA.

It is an aggravating thought that one of the commonest infective diseases which attack mankind, has an unknown ætiology. To the question, "What is influenza?" there is as yet no satisfactory answer. The disease has no specific character, no pathognomonic feature, on which the clinician can base an assured diagnosis. He is forced, instead, to rely on a multiplicity of characters which correspond to epidemics of which he has had previous experience. The physician falls back on his clinical acumen and uses his thermometer and stethoscope rather than the microscope and test-tube. One American writer, Dr. J. J. Hurley, has gone so far as to deny flatly that such a disease as influenza exists and he has marshalled all the wisdom of Aristotle in support of his denial.[1] Logic, "which holds no brief beyond the grave" and is the final court of appeal, is arrayed in all its glory to prove that what is called influenza is not influenza at all, but "nasal sinusitis." We must confess to a guilty feeling of ignorance as we read Dr. Hurley's admirable disquisition. We found it difficult to correlate the "principle of contradiction," the "principle of excluded middle" and the "*summa decem* or ten categories of Aristotle" with such a banal disease as influenza. Dr. Hurley appeared to our untutored mind to have constructed a labyrinth out of which only he was capable of emerging. It was possible, however, to gather that the author's view was that in the disease called influenza the only constant factor was an acute mucous or purulent infection of the accessory nasal sinuses. He demands, accordingly, that the disease be called "epidemic nasal sinusitis." We make no attempt to belittle the truth or ingenuity of Dr. Hurley's proof by logic, but it seems strange that he should fail to adduce statistical evidence of his contention that sinus infection is the one phenomenon of the disease invariably present. True, he quotes Weichselbaum and one or two other observers, but there are numerous equally skilful investigators who have failed to report that sinus infection is an invariable feature of influenza. But, even assuming that Dr. Hurley's thesis is true, the suggested re-naming of the disease would merely serve to concentrate attention on the accessory nasal cavities. The nature of the infection would still be as mysterious as ever. It is necessary to know little logic to appreciate the fact that a constant feature of a disease is not the disease itself.

But, if Dr. Hurley dashes along on the high gear of logic, Dr. C. H. Bunting[1] is content to progress at a slower rate. He has attempted to describe the "leucocytic picture" of patients suffering from influenza. He found that, early in the course of mild infections, there occurred a mild neutrophile leucocytosis, followed in one or two days by a leucopenia, which is due to a sudden disappearance of polymorpho-nuclear leucocytes. The leucocytic reduction may be as great as 75% and is associated with a slight lymphocytosis. Eosinophile and basophile cells and blood platelets show a similar reduction. It is assumed that the leucopenia is due to inhibition of the bone marrow by the invader, an inhibition which has similarly been held to exist in typhoid fever. The return of the leucocytes to normal numbers is a gradual process and is not complete till several days after the patient's temperature and pulse have returned to normal. Dr. Bunting regards this poverty of circulating leucocytes as the factor responsible for the frequency of pyogenic complications in the disease. He insists on this ground, that it is unwise to allow a patient to resume his avocation on the cessation of fever, but that he should rest for a full week more, when his white cell count will have returned to normal limits. Whenever recovery failed to occur within a week and evidence of pulmonary involvement or pneumonitis set in, such as the presence of consonating râles or fine crepitations at the base of a lung, there occurred, coincident with the return of the fever, a leucocytosis of 12,000 to 20,000 cells in each cubic millimetre of blood. With resolution of these pulmonary changes, the leucocyte count changes to normal. The similarity of these appearances to those of typhoid fever is striking. In both diseases leucopenia is the characteristic feature of the uncomplicated and leucocytosis of the complicated disease. Dr. Bunting's findings tally with those of several recent observers, among whom is Dr. Adler, of Zurich, who has recorded strikingly similar findings. Considered independently, however, his work is open to two objections. Firstly, he considered it sufficient to count only 200 cells. The possible error with this limited number is enormous. One microscopic field may, for example, be entirely free of eosinophile corpuscles, while another contains them in comparative plenty. It is necessary to examine many fields in many portions of the slide to obtain a reasonable degree of accuracy. Secondly, the number of persons on whom leucocyte counts were done was limited to ten. It is surprising under these circumstances that his results were so uniform.

THE ACCESSORY FOOD FACTOR OF SCURVY.

Since Gowland Hopkins first discovered that growth in young animals was inhibited when a diet was given containing adequate amounts of protein, carbo-hydrate, fat and salts in a dried condition, but could be revived when a minute quantity of fresh green vegetable or fruit or milk was added to this otherwise suitable diet, a very great deal of

[1] *Medical Record*, May 14, 1921.

[1] *The American Journal of the Medical Sciences*, July, 1921.

thought and experiment have been given to this subject. Little by little the elementary facts concerning the biological behaviour of these accessory food factors have been disclosed. Further study has been directed toward the elucidation of the physical and chemical characters of these bodies. Some observers have endeavoured to make quantitative estimations of the fat-soluble A factor and of the water-soluble B factor. Success has not attended these investigations. At first sight it would seem as if these so-called factors were similar or analogous to enzymes. Both ferment action and the action of the accessory food factors follow the ingestion or application of surprisingly small quantities of the pabulum. The action in both cases is prolonged and extensive, even when minimal quantities of the ferment or factor-bearing substances are supplied. In the next place, the action seems to be enhanced by the presence of certain definite chemical substances, which alone are quite devoid of any catalytic action. Harden and Young showed in their well-known experiments with the co-ferment of yeast the activating nature of added phosphate. The peculiar lability of some of the enzymes to the effect of heat is strangely imitated in the case of two of the accessory food factors. It has been suggested that enzymic action is produced by a definite molecular arrangement of the globulin fraction of certain organic substances. It is just as probable that the action of the accessory food factors is dependent on a peculiar molecular arrangement of vegetable proteins or other chemical complexes. The fact that the action depends to a considerable extent on the freshness of the substance may be used in support of this hypothesis.

An attempt has recently been made to determine the chemical nature of the antiscorbutic food factor by Dr. J. W. Kerr, of the United States Public Health Service.[1] The plan on which he worked, was somewhat crude, but information of value has been gathered, although the evidence at present available is insufficient to compel acceptance of some of his deductions. Having determined that five cubic centimetres of lemon juice sufficed to protect guinea-pigs from scurvy when fed on a diet which led to the appearance of scurvy without some addition, he discovered that an alcoholic extract of five cubic centimetres of the lemon juice also protected against scurvy. In view of the fact that five cubic centimetres was the smallest quantity of juice capable of protecting, he deduced from the experiment that the whole of the antiscorbutic element was removed by alcoholic extraction. Unfortunately, he neglected to ascertain whether the alcohol-insoluble fraction was entirely devoid of protective properties. We are disinclined to attribute importance to quantitative estimations of this action. He then found that the factor was not removed by ether extraction, nor was it dissolved in chloroform or carbon tetrachloride. Acetone and ethyl acetate extracts of lemon juice proved to have antiscorbutic properties, although the amount of juice subjected to extraction needed to be larger than in the case of the alcohol solution. He failed to remove the factor by adsorption on finely powdered charcoal. In this connexion, it would appear as if the antiscorbutic vitamin[1] differs from the antineuritic vitamin. A further difference between these two factors lies in the fact that the former is not precipitated by phospho-tungstic acid, but may be destroyed by it, while the latter is precipitated. In the last place, he has attempted to prepare an aqueous solution of the antiscorbutic accessory food factor in a pure condition. The details given concerning the solution are insufficient to admit of a critical opinion concerning the probability of its true chemical isolation. He found that the substance or substances in solution were practically non-nitrogenous. The solution is said to be strongly acid, slightly bitter of taste and very rich in carbon. It reduced Benedict's solution. Further information concerning the properties of this alleged pure preparation are promised. In the meantime, we confess that the information available at present does not appear to necessitate a relinquishment of the hypothesis that accessory food factors may be functions of chemical substances rather than independent chemical entities.

[1] *The Military Surgeon*, August, 1921.

[1] A few months ago the Chemical Society in Great Britain directed that basic substances including alkaloids should be indicated by the termination *ine* and that the termination *in* should be restricted to neutral compounds, such as glycerides, glucosides and proteins. The word vitamin, introduced by Casimir Funk, must therefore be written without a terminal "e." This term is unfortunate, in that the accessory food factors are certainly not amines.

GLAND PUNCTURE.

The possibility of basing a diagnosis of an infection or of certain other pathological processes on the results of the microscopical examination of fluid aspirated from an enlarged gland has not, as far as we are aware, been exploited in practice. Dr. C. G. Guthrie,[2] having been struck by the ease with which a trypanosomiasis in a human being was revealed in this manner, has studied the method with the view to ascertain how far it can be used in various disease conditions. The gland puncture must be accomplished under aseptic conditions and the glandular fluid aspirated under suction. As a rule, very little fluid is gained, but this little suffices for both dark ground and stained film examination.

He has succeeded in recovering and identifying *Spirochæta pallida*, tubercle bacilli, trypanosomes, streptococci and staphylococci from involved glands. In cases of Hodgkin's disease the cellular picture has enabled him to make a diagnosis which has been confirmed by clinical and hæmatological evidence. The presence of large numbers of eosinophile cells, of large endothelial cells and of the so-called "Dorothy Reed" or multi-nucleated giant cells has been recognized in the films derived from the gland puncture. Similarly, he claims that the diagnosis of leuchæmia and simple adenitis can be based on the cytological appearances of the aspirated glandular fluid. The method appears to be worth investigating, more especially because the puncture does not interfere with the subsequent removal and histological examination of the gland.

[2] *Bulletin of the Johns Hopkins Hospital*, August, 1921.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

(178) Phacerisis.

I. Barraquer, beginning with an enumeration of the well-known advantages of intra-capsular extraction, describes his method of extracting cataract in the capsule (*Archives of Ophthalmology*, July, 1921). The instrument which he uses, is essentially a small cup on a handle, which is capable of grasping the lens by means of a vacuum created by a motor. The operation is performed in a dimly lit theatre, the field being illuminated by a beam of artificial light. Two hours before operation an elaborate preparation of the patient begins. The ciliary border of the eyelid is painted with a 4% solution of silver nitrate and every ten minutes cocaine, euphthalmine and adrenalin drops are instilled. By this means anæsthesia and dilatation of the pupil are obtained after an hour and a half. If there is spasm of the *orbicularis*, novocaine is injected into the facial nerve. No speculum is used, but an assistant holds up the upper lid by means of a Desmarre's elevator and holds down the lower lid with his thumb. The section involves two-fifths of the cornea, with a conjunctival flap. Usually a peripheral iridectomy only is made. The operator now uses the Desmarre's elevator with his left hand and inserts the cup into the anterior chamber, slipping it along the surface of the lens and below the lower edge of the iris. He presses a button and the vacuum is produced in the cup, whereby the lens is gripped and caused to vibrate and the zonular fibres are ruptured. The cataract is delivered by its upper border, if an iridectomy has been made. If the patient looks down too far, or if the palpebral fissure is opened too freely, there is danger of loss of vitreous. "In simple extraction or in peripheral button-hole iridectomy, we allow the lens to deliver by its inferior border, which is easily done by turning the instrument so that the posterior surface of the lens presents towards the cornea." This is the method recommended and the one associated with the fewest accidents. A bichloride salve of 1 in 3,000 is applied to the eyelids and the eyes bandaged. The operated eye is untouched for four or five days.

(179) Ocular Symptoms in Syphilitic Hypophyseal Disease.

G. E. de Schweinitz (*Archives of Ophthalmology*, May, 1921) describes the ocular symptoms of hypophyseal disease in syphilitic subjects. He recognizes three groups of the disease. The first includes non-syphilitic pituitary disease in syphilitic persons. In the second the pituitary lesion is itself syphilitic. In the third group the hypophyseal disease occurs in the subjects of doubtful syphilis. The following case illustrates the first group. A man, aged 49 years, had demonstrable syphilis, with fine chorioidal changes. He suffered also from pituitary disease, as shown by the skiagraphic appearances of the *sella turcica* and bitemporal colour hemianopsia. He complained of bad sight, headache and diplopia. Exophthalmos was present, as well as paralysis of the right external rectus and convergent squint. Sellar decompression, followed by the exhibition of pituitary body extract and specific treatment, resulted in considerable improvement. A second case was that of a man of 45, with a history of a primary syphilitic sore, who complained of diplopia and failing vision. There was paresis of the right external rectus and convergent strabismus. The field showed temporal colour hemianopsia and other changes. Energetic specific treatment met with a prompt and satisfactory response. Later the patient neglected his treatment and had a relapse. On resuming treatment the result was satisfactory. In this case the pituitary lesion was itself syphilitic. The cases are also described of three women, who suffered from hypophyseal disease and were the subjects of doubtful syphilis. They were all treated with thyreoid extract and pituitary body extract and with inunction of mercurial ointment. The results were good. The combination of these three agents appears to be a valuable one.

(180) Sloughing Cornea in Graves's Disease and in Disseminated Sclerosis.

T. Harrison Buller describes the case of a woman suffering from exophthalmic goitre, who had such exaggerated proptosis that the left cornea could not be covered by any effort (*British Journal of Ophthalmology*, July, 1921). She rejected his advice to have the lids sutured together and a month later was seen with an infiltrated anæsthetic cornea, which soon developed an ulcer and onyx. The cornea was incised and the lids sutured. In two days the sutures cut out and the eye re-opened. Cauterization failed to check the spread of ulceration and the eye was finally enucleated. The second cornea began to ulcerate, but the patient by this time was very low and soon died of heart failure. The author also describes the case of another woman of 36 years who had suffered from disseminated sclerosis for two years. When seen by the author, her right eye was injected, the cornea was anæsthetic and perforated and the anterior chamber three-quarters full of pus. In spite of treatment the cornea sloughed away. The patient died suddenly of asphyxia from laryngeal spasm.

(181) Cause and Prevention of Myopia.

F. W. Edridge-Green has decided, in the light of recent observation, that the belief that myopia was caused by war work must be abandoned (*Lancet*, March 5, 1921). In some well-lighted schools there is a higher percentage of myopia than in others less well lighted and rural children are more often myopic than urban. That excessive convergence does not cause myopia is supported by the fact that convergent squinters are usually hypermetropic. The predisposing cause most commonly advanced is heredity and exciting causes are measles, whooping-cough and bronchitis. The onset or increase of myopia is often associated with certain occupations which involve heavy lifting in a stooping position. These forms of exertion cause a feeling of tension in the eyes and raise the intra-ocular pressure. The posterior portion of the *sclera* is a weak spot which will give way on undue pressure, especially in the soft and growing eye of the young. One millimetre of stretching causes three diopters of myopia. Whether the eye will stretch or not depends on the power of the sclerotic to resist the increased pressure. For the prevention of myopia those exercises which cause intra-ocular pressure should be avoided, *e.g.*, that exercise in which the child is prone and raises itself up and down on its hands, should be abolished. Hard cycling and heavy weight-lifting and boxing are bad for myopes. Exercises should be performed as far as possible in the erect position, with the eyes pointing forward.

(182) Surgical Treatment of Epitheliomata of the Cornea.

L. M. Francis has summarized the opinions of pathologists and clinicians on epithelioma of the limbus. They agree that the process is relatively superficial and has a slight tendency to invade deeper structures. It is relatively non-malignant and of slow growth and does not tend to involve lymph glands (*Archives of Ophthalmology*, July, 1921). Hence these tumours offer a fair prospect of success to surgical attack. The author advocates the following operation: A keratome incision is made in the sound corneal tissue, well in advance of the tumour border, through several layers, almost as far as Descemet's membrane. The lip of the corneal wound is prized by the keratome, until a grasp can be obtained with forceps. The corneal flap is peeled back by blunt dissection, until the limbus is reached. The flap is continued backwards towards the fornix and episcleral tissue and is excised. The conjunctiva on either side is undermined and united.

(183) Subnormal Accommodation.

P. Sumner had three patients suffering from weak accommodation, who each had infected tonsils. As they refused to have them removed, he could not prove the suspected relationship (*American Journal of Ophthalmology*, May, 1921). During the last two years he had three similar cases. One patient consented to have his tonsils removed. He was a man of 24 years, who had complained of headaches and drowsiness in the evening if he tried to read. With correction his *punctum proximum* was 20 cm.. After removal of tonsils and adenoids his near point advanced to 10 cm. and he read with comfort. The neurasthenic with weak accommodation suffers most in the morning.

LARYNGOLOGY AND OTOLOGY.

(184) Œsophagoscopy.

R. Bensaude and M. Lelong (*La Presse Médicale*, May 25, 1921) have designed two methods of facilitating the technique of œsophagoscopy. In the first method the inner tube of Bruning's instrument is moved up and down in the outer by means by a rack and pinion movement, similar to that of a microscope, and not by a spring handle. The inner tube comprises a principal segment 25 cm. long and a number of short segments by which the tube can be lengthened. The lower end of each short segment engages readily with the upper end of that in the outer tube. The second method deals with the position of the patient. The authors recommend the knee-chest position, which has the advantages that no assistant is required; that the saliva escapes readily, since the patient's mouth is at the lowest level; that the introduction of the tube is easy; that the cervical, thoracic and abdominal organs fall away from the vertebral column and do not compress the gullet; that the examination of the inferior œsophagus and cardia are especially facilitated; and that patients prefer this position. The patient assumes the genu-pectoral position on the table, with a pillow under his knees, his elbows rest on the table and his head is low. The operator squats and introduces the tube-spatula obliquely upwards. As the head bends backwards, the instrument is able to slide along the posterior pharyngeal wall into the œsophagus. The tube then becomes parallel to the vertebral column and the patient straightens up, extends the left elbow and supports himself on the right elbow, while the operator rises to some extent. Next, when the extremity of the tube reaches the inferior third of the œsophagus, it is directed to the left and ventrally. The latter movement is facilitated when the patient continues to straighten and when the operator rises to an upright position or stands on a stool.

(185) Vestibular Face Reflexes.

S. Mygind (*Journal of Laryngology and Otology*, July, 1921) observed while performing a series of vestibular examinations in infants that, when the child was rotated in the sagittal plane, a reflex was induced in the form of a vertical nystagmus, with the slow phase upwards and that this was accompanied by a lifting of the upper eyelid, a wrinkling of the forehead and sometimes by an upward curl of the upper lip. When a nystagmus with slow phase downwards was induced, there occurred an active drawing down of the eyebrows, a smoothing of the forehead and sometimes a slight downward curl of the lips. Mygind also found that, in connexion with horizontal nystagmus, a facial reflex occurred both during and after rotation in the form of a contraction appearing in the cheek on the side to which the slow phase of the nystagmus was directed, the corner of the mouth being pulled a little to the side and upwards and the palpebral fissure on that side becoming slightly enlarged. Mygind has found these reflexes in prematurely born children at the seventh month, but not in infants over six weeks of age. It appears when the child is awake or asleep. Its disappearance soon after birth he ascribes to the increase of the development of the cortical cerebral tracts. He thinks that the reflex itself may be due to a deep running reflex arc in the cerebellum, involving centres of the facial nerve, representing, like other nerves there, directions of movement rather than anatomical groups of muscles or peripheral nerves.

(186) Disease of the Otolith Apparatus.

R. Bárány has recently described a case of disease of the otolith apparatus in a woman aged 27 years (*Journal of Laryngology and Otology*, May, 1921). She had suffered from headaches for a year. The caloric reaction on each side was normal and a study of the nervous system showed no abnormality. Rheumatoid thickenings of the neck and shoulder muscles were present. For fourteen days she had suffered from attacks of giddiness of half a minute's duration, during which marked rotary nystagmus to the right, with an upward vertical component, was seen. These attacks only occurred when the patient lay on her right side. Immediately after cessation of an attack the patient had to remain for a time on her back or left side, before another attack could be induced by turning her head to the right. Bárány satisfied himself that it was not movement, but position, which evoked the symptoms. Wittmaach showed that when guineapigs were rotated at the rate of 2,000 revolutions a minute, the otolith membrane became detached and Magnus showed that when this membrane was detached, all the so-called compensatory eye movements (*i.e.*, the reflex of position) were absent, while the movement reflex (*i.e.*, the semi-circular canal reaction) was present. Hence Bárány holds that the compensatory eye movements are referable to the otolith apparatus, the stimulation of which is affected by the action of gravity.

(187) Intra-Nasal Suppuration.

E. Ross Faulkner (*New York State Journal of Medicine*, April, 1921) states that, during the first 24 or 48 hours of an acute inflammation of the nasal mucosa, the internal administration of opium is usually the only treatment indicated. As the nasal discharge becomes muco-purulent, a hot saline irrigation, combined with suction and followed by a post-nasal douche of 10% to 20% argyrol, will soon cause a resolution of the submucous infiltration in the nose and sinuses. The author advises operation in the following conditions: (*i.*) When in certain acute cases there are severe, persistent pain and high temperature, or symptoms pointing to extension to the orbit or cranial cavity. (*ii.*) When there is present a chronic, profuse, purulent discharge, which will not clear up on treatment. (*iii.*) When there is usually only a slight discharge, but acute exacerbations, with chronic headache and malaise, are frequent. (*iv.*) In asthma. (*v.*) When there is nasal obstruction due to polypi, especially if associated with asthma. (*vi.*) When suppuration in the sinuses acts as a focal infection, producing eye or joint symptoms. (*vii.*) When there is involvement of nerves (usually the second or sixth) proximal to the sphenoid and posterior ethmoid sinuses. (*viii.*) When signs of extension to the orbit or cranial cavity are manifested. (*ix.*) When a nucocele causes nasal obstruction or points externally.

(188) Arterial Tension in Oto-Rhino-Laryngology.

Georges Canuyt (*Journal de Médecine de Bordeaux*, May 25, 1921) believes that *tinnitus aurium* is probably at times due to arterial hypotension or hypertension. In hypertension the employment of sodium citrate, which alters the viscosity of the blood, may give happy results, but the method of choice is a milk or a mixed milk and vegetable diet, combined with laxatives. In serious cases blood letting may be practised. In hypotension it is often efficacious to give night and morning 0.6 c.cm. to 1 c.cm. of a 1 in 1,000 solution of adrenalin. Various forms of vertigo are due to circulatory disorders. They may arise from a general morbid condition or may be associated with an unstable circulatory equilibrium, due to angiospasm—the Lermoyez syndrome. These latter forms are unfavourably influenced by certain drugs, *e.g.*, quinine and pilocarpine, which are contra-indicated generally in hypotension with vertigo. Adrenalin gives good results. Hypertension in Ménière's disease and in arterio-sclerotic conditions is favourably treated by blood letting, leeches, purging, pilocarpine, etc., but especially by a milk or milk and vegetable diet. In these cases adrenalin is harmful and aggravates the symptoms.

(189) Naso-Pharyngeal Inflammations.

A "common cold" is in most instances the result of a local infection. Various constitutional and environmental factors may be concerned. Resistance to bacterial infection may be lowered by excessive chilling. Stuart Mudd, Samuel B. Grant and Alfred Goldman (*Journal of Laboratory and Clinical Medicine*, January-March, 1921), by elaborate experiments, show that chilling of the body surface causes reflex vaso-constriction and ischæmia in the mucous membranes of the nasal cavity, post-nasal space, palate, oro-pharynx, naso-pharynx and palatine tonsils. They admit that this view is at variance with views often expressed. The authors state that in other instances the cause described by Hill and Muecke, *i.e.*, crowding of persons in overheated places, followed by emergence into a cold atmosphere, is doubtless responsible for colds.

British Medical Association News.

SCIENTIFIC.

A MEETING of the South Australian Branch was held at the Lister Hall, British Medical Association Building, Hindmarsh Square, Adelaide, on August 25, 1921, DR. BRONTE SMEATON, the President, in the chair.

DR. J. W. BROWNE read a paper on "The Prevention and Treatment of Pulminary Tuberculosis" (see page 333). The reading of this paper had been postponed from the meeting of the Branch on July 28, 1921.

DR. D. R. W. COWAN read a paper on "The Problems of Tuberculosis" (see page 341).

Owing to the lateness of the hour, the proposal was adopted that the discussion on these two papers should be deferred. It was further resolved that the papers should be published in THE MEDICAL JOURNAL OF AUSTRALIA as soon as possible, in order that the members might have an opportunity of studying them prior to the discussion.

MEDICO-POLITICAL.

ANNUAL MEETING OF DELEGATES OF THE AFFILIATED LOCAL ASSOCIATIONS WITH THE COUNCIL OF THE NEW SOUTH WALES BRANCH.

THE annual meeting of the delegates of affiliated local associations of members with the Council of the New South Wales Branch was held on October 7, 1921, at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, DR. FOURNESS BARRINGTON, the President, in the chair. Every local association was represented and the members of the Council were present in full muster.

Welcome to Members.

DR. FOURNESS BARRINGTON welcomed the delegates to the meeting. He expressed the opinion that there was an immense value in a free exchange of thought and ideas. The annual gatherings of delegates with the Council had been useful, but he thought that they would become increasingly so as time passed. He referred to the absence of Dr. R. H. Todd, to whom the annual meeting of delegates was a special hobby.

Letter of Condolence to the Government.

DR. T. W. LIPSCOMB moved that a letter of condolence should be addressed to the Acting Premier of the State Government on the death of Mr. John Storey and to Mrs. Storey. The motion was carried.

Regulation of Friendly Society Practice.

DR. T. W. LIPSCOMB stated that the Medical Politics Committee had considered, at the instigation of a member, the significance of two clauses in the Common Form of Agreement in regard to surgical operations. The question raised was the definition of a surgical operation. A member had inquired whether the suturing of a large wound, necessitating the administration of an anæsthetic, carried with it the charging of a fee. It had been held by the Medical Politics Committee that if the anæsthetic were administered by the medical officer of the lodge as well as the operation, an inclusive fee should be charged.

DR. G. A. BUCHANAN (Central Southern Medical Association) stated that this matter had been discussed at a meeting of his association and, as a result, he had been instructed to move:

> That it is considered that, in the case of any surgical procedure, where an anæsthetic, general or local, is indicated or requested by the patient, the medical officer is entitled to charge a fee for the operation, in addition to that for administering the anæsthetic. When an anæsthetic is not indicated nor requested by the patient, the decision be left to the individual practitioner.

In the course of a discussion on this subject, the proposal was put forward that the clause might be interpreted by defining an operation as a surgical intervention necessitating the administration of a general or a local anæsthetic. This definition appeared to the majority of the members to be unsatisfactory, because it would be difficult to decide when the anæsthetic would be necessary. In some districts a fee was paid when a surgical procedure was carried out under anæsthesia, but not when no anæsthetic was administered. A case was cited in which a patient had submitted to the insertion of twenty sutures into his scalp without an anæsthetic. The suturing in this case was undoubtedly a surgical procedure, demanding judgement and aseptic technique. The Council had expressed the opinion that much difficulty would be obviated if arrangements as to fees could be made prior to the attendance in these cases. Several amendments were refused and the original motion was adopted by a large majority.

DR. T. W. Lipscomb asked the meeting to discuss the attitude of the Branch in regard to the formation of friendly society lodges at outlying centres. He pointed out that although no member had entered on an agreement with a lodge established in a place where no medical practitioner was resident, this question had been raised on many occasions. The Council had held that it was undesirable for members to enter into agreements which would involve attendance at an outlying centre, especially if the contract did not recognize the medical officer's residence. He therefore moved:

> That attendance on friendly society lodges at outlying centres is undesirable and that all Common Forms of Agreement be made as from the medical officer's residence.

Some members suggested that there would be no objection if regular visiting days were recognized and all members were properly examined before admission to the lodge. Mileage would be charged. Other members held that no mileage should be charged unless a special visit were paid. In scattered districts special arrangements might be necessary. In the end the motion was carried.

Proposed Amendments of the Common Form of Agreement.

DR. T. W. LIPSCOMB explained that the Council had had some very friendly discussions with the representatives of the friendly societies on the subject of the Common Form of Agreement. The Council had been met in an amicable spirit when the alterations in connexion with the rates and the income limit clauses had been decided. The representatives of the friendly societies had asked for certain amendments and had provided the Council with the arguments in support of their claims. The Council had drawn up replies to these arguments.

In the first place, it was suggested to exempt from medical examination the children of candidates for admission as members of friendly society lodges. The examination, it was claimed by the friendly societies, was rarely carried out. The Council had pointed out that there was a principle involved, namely, that the medical officer should have the right to examine before admission, not only the candidate, but also all dependants who would, if admitted, be entitled to his services. It was resolved to recommend the Council not to amend the clause.

The second suggestion on the part of the representatives of the Friendly Societies' Association of New South Wales was that reduced rates should be provided for single female members and juvenile members. It was claimed that it was neither fair nor logical to charge female and juvenile members the same rates as members with dependants. In Victoria, Queensland and South Australia reduced rates were charged. In regard to female members, it was pointed out by the Council that the rates had been fixed on averages. The medical officers of lodges undertook to attend some married members with dependants, some married members without dependants and some single members. Moreover, single female members, as a rule, needed more medical attendance than single male members. The Council had held that the question of juvenile members was a small one. It had been stated that 95% to 96% of members of juvenile branches were already covered as regard medical benefit, in that they were the dependants of members of lodges.

Very little time was taken up on the question of the reduction of rates for single female members. All delegates expressed the view that this could not be conceded. On the other hand, opinions were divided as to whether

children might or might not be admitted to medical benefit in the juvenile lodges at a lower rate than that obtaining for ordinary lodge attendance. It was eventually resolved that the Council be recommended not to disturb the present arrangements.

The most important amendment asked for was that involving the elimination of the word "minimum" in regard to the rates for attendance. The representatives of the friendly societies had claimed that the rates should be uniform throughout the State. It was argued that it was not in the interests of the members of friendly societies, nor in that of the doctors, that rates higher than those held by the Council to be just, should be charged. The Council, in reply, had pointed out that in a very few instances some medical officers had obtained the consent of the lodges to charge higher rates than the minimum on account of bad roads, scattered districts and other local circumstances. In the course of the debate it was urged that some medical practitioners were unwilling to undertake lodge work, but, on being pressed by a lodge, they had agreed to do so, provided that higher rates than the minimum were paid. In all cases in which a higher rate was paid, the lodge had agreed to the increase. The arrangements of rates higher than the minimum was always one for negotiation between the medical officer and the lodge. If the lodge required the services of a certain medical practitioner, it should be permitted to secure this on terms agreeable to both parties. It was therefore resolved that the Council be recommended to retain the word "minimum."

The fourth proposal of the representatives of the friendly societies was that a uniform fee of 2s. 6d. should be charged for extra certificates required for friendly society purposes. Some members belonged to two lodges. It was held that, while they obtained a certificate from the lodge medical officer as part of his attendance, extra certificates, required to secure benefits from the second lodge, should be given for a uniform, small sum. This claim was regarded as a reasonable one and the amendment was approved.

Finally, the representatives of the friendly societies asked for an interpretation of three clauses of the Common Form of Agreement. A long debate followed on the advisability of drawing up a schedule of fees for surgical operations and other special services. It transpired that in some districts schedules were in existence, while in others fixed charges for special services were not encouraged. It was generally conceded that it was desirable for the medical officer to enter into a special arrangement with his patient whenever possible before the commencement of the treatment in regard to fees. It was resolved that an interpretation of the clauses be drawn up by the Council and forwarded to the representatives of the Friendly Societies' Association of New South Wales, as desired. The question of the introduction of a schedule of fees for surgical and special treatment was deferred.

Other Proposed Amendments.

Motions having for their object the restriction of the examination of applicants for membership of lodges to the surgery of the medical officer, the charging of special fees for attendance on lodge patients on Saturday afternoons and Sundays, the introduction of a so-called "open panel" system, *inter alia*, were considered. No fundamental change in the regulations of lodge practice was approved, in view of the general expression of satisfaction in the smooth working of the lodge agreement.

Advertisements in the Daily Press.

Dr. R. B. Wade, on behalf of the Ethics Committee of the Council, asked the delegates to recommend the Council to introduce a regulation restricting members in the metropolitan area of Sydney in advertising changes of address, commencement or resumption of practice and the like to the two morning newspapers of Sydney. It was regarded to be undesirable for these advertisements to be inserted in suburban newspapers, many of which appeared only once a week. In these newspapers the advertisement habitually occupied at least one inch of space and was displayed in contravention of the regulation of the Branch.

Dr. F. Guy Griffiths (Northern Suburbs Medical Association) claimed that the regulations concerning these advertisements were not being obeyed in the great dailies, in that the type used for the names of the advertisers was always different from that employed in the remainder of the advertisement. He maintained that the rules were frequently defied in other respects.

Dr. Fourness Barrington expressed the opinion that the advertisements of change of address or resumption of practice were unnecessary and that it would be better if the permission were withdrawn altogether. In supporting the proposal of the Ethics Committee, he asked Dr. Guy Griffiths to provide definite information concerning the breaking of the regulation. The Council would take action if it could be shown that a member had transgressed. The newspapers were being watched very carefully in the office of the Honorary Secretary and he doubted whether any transgression escaped notice.

The motion was carried.

Pay of Area Medical Officers.

Dr. E. H. M. Stephen (Western Suburbs Medical Association) moved:

> That the delegates to the annual meeting of delegates with the Council inform the Council that the present addition of £25 *per annum* in the area medical officer's salary is inadequate, considering the work has been practically doubled, and that £125 *per annum* should be the minimum remuneration.

Dr. C. H. E. Lawes thought that it would be useful if the delegates would give an expression of opinion on this important matter. It was, of course, a question which should be referred to the Federal Committee. Formerly there had been 75 area medical officers in the Second Military District. The number had been reduced to 40. Incidentally, the pay had been increased from £60 to £85 a year. The work had become much more arduous, since, in many instances, the area had been increased very considerably. The medical officer had to attend the wives and families of some of the officers of high rank without extra remuneration. Many of these officers were even more troublesome than lodge patients.

Dr. J. Kerr (South-Eastern Medical Association), speaking as an old area medical officer, expressed the opinion that, even if the pay were doubled, it would still remain inadequate under the new conditions. He claimed that no man could afford to do the work efficiently in the enlarged areas.

Dr. J. T. Paton (Western Medical Association) did not agree that the work was increased under the revised regulations. It was true that the areas had been enlarged, but his experience had been that he did approximately the same amount of work as previously, while his pay was increased. There was a provision that when an examination would necessitate the medical officer being absent from his home for twenty-four hours, he could arrange for the work to be carried out by the local medical practitioner, who would be paid by the Department the sum of 2s. 6d. for each examination.

Dr. F. O. Stokes (Eastern District Medical Association) confirmed Dr. Paton's remarks as regards area medical officers in the country.

Dr. Fourness Barrington pointed out that, as due notice of the motion had not been given, the matter had not been fully discussed in the local associations. The opinions expressed were consequently those of the delegates.

The motion was carried, as was one to the effect that the Council be recommended to refer the matter to the Federal Committee.

Honorary Medical Officers and Fees.

Dr. T. W. Lipscomb moved on behalf of the Medical Politics Committee of the Council as follows:

> That this meeting of local associations with the Council re-affirms the view that has hitherto been held by the Council, *viz.*, that honorary medical officers should not accept fees from patients in the general wards of public hospitals.

He explained that recent events at Albury had brought the matter of the right of medical practitioners holding positions in public general hospitals in an honorary capacity to accept fees for attendance on patients in the general wards of the hospitals to the notice of the Council.

The Committee of the Albury Hospital had permitted the medical officers of that institution to accept fees. The Minister of Health had stated in clear and unmistakable language that the public hospitals were primarily for the "sick poor" and that their needs would have to be regarded as paramount. The Minister had taken the attitude that fees might be charged by honorary medical officers in country hospitals under certain definite conditions. In the first place, the admission of well-to-do patients should not be effected if this interfered with the admission of necessitous patients. In the second place, there should be no discrimination between the patients and all should be treated in the same manner. Thirdly, any financial arrangements between the medical officer and a patient must be made prior to admission. Lastly, the patients should be required to pay the full charges for maintenance to the hospital. While the Council welcomed the definite dictum that the public general hospitals were primarily for the "sick poor," they held the view that honorary medical officers should not charge for attendance on any patients in the general wards of public hospitals. In small country towns, where there was a small public, but no private, hospital, an exception would necessarily have to be made. Dr. Lipscomb thought that the principle should be reaffirmed.

DR. E. H. M. STEPHEN (Western Suburbs Medical Association) seconded the motion.

DR. O. A. A. DIETHELM (North-Eastern Medical Association) opposed the motion. He held that the country members could not agree that they should not charge their well-to-do patients when, for one reason or another, they received treatment in public hospitals. He claimed that the majority of patients went into public hospitals in the country for operations and similar treatment. These patients were charged the full maintenance fees, which, at times, were as high as four guineas a week. It seemed to him to be wrong for a patient who could afford to pay for maintenance, to obtain his medical and surgical attendance gratuitously. Even where a private hospital existed, a large class of persons could not be induced to go to it.

DR. J. KERR (South-Eastern Medical Association) thought that the Council had forgotten for the moment the interests of the country members. In the metropolitan area the honorary medical officers were on a totally different footing. The Minister of Health might say that the public hospitals were for the sick poor, but in the country this was not a fact. Apart from the average citizen, who sought admission to the public hospital whenever treatment for serious affections was needed, there were the contributory institutions, whose members had the right of admission. He held that the majority of the country hospitals were no longer charitable institutions. Dr. Kerr referred to the attitude adopted in England and quoted a resolution passed at the Representative Meeting at Newcastle in July, 1921. He held that in places where there were no private hospitals, well-to-do patients should be required to pay fees. He stated that the public hospitals should not enter into competition with the private hospitals.

DR. K. S. MACARTHUR BROWN (Central Western Medical Association) moved as an amendment:

> That, under the conditions already laid down by the Minister of Health, as mentioned in the Council's letter to local associations, dated July 11, 1921, honorary medical officers of public hospitals be allowed to charge patients in the general wards.

DR. R. A. ROBERTSON (Border Medical Association) claimed that his local association as a whole was in favour of the right of honorary medical officers to charge fees of well-to-do patients in public hospitals. He stated that there were four practitioners in Albury who were honorary medical officers at the hospital and two who received an honorarium. The Albury Hospital was exceptionally well equipped. Although there were good private hospitals in the town, none of them could compete with the public hospital in regard to equipment. Dr. Robertson maintained that there was a great deal of hospital abuse in existence. The members of the committee of the hospital were business men and they claimed that the institution was open to all and sundry. Each of the medical officers had the right to admit his own patients to the hospital, provided that he notified the commitee beforehand that the patients were paying patients. No difference was made between the patients in the wards. The financial arrangements were private matters between the doctor and his patient. No non-paying patient was ever refused admission because the necessary bed was occupied by a paying patient. This arrangement gave the medical practitioner absolute control over his patient. If a medical practitioner would not sanction the admission of his patient to the public hospital, the patient sometimes went to Sydney and gained admission at a large metropolitan hospital, through not disclosing his financial position. He claimed that this was the only practical method of dealing with hospital abuse. It was impossible for the country doctors to fight the committees who determined that rich and poor alike could gain admission to their hospitals. He would welcome it if the Branch could bring in an effective method to prevent the well-to-do from using the public hospitals. Dr. Robertson had found that the recognition of the right of the medical officer to charge fees had resulted in keeping many patients away from the public hospital.

DR. F. O. STOKES (Eastern District Medical Association) supported Dr. Robertson's arguments.

DR. MACARTHUR BROWN'S amendment was carried and adopted as a substantive resolution.

Fees for Life Insurance Examination and Report.

DR. T. W. LIPSCOMB asked the delegates to reconsider the fees to be charged for examination of proponents for life insurance and report.

In the course of a short debate the arguments that have been used on many occasions during recent years in regard to this question, were put forward. In the end it was resolved:

> That where the amount of the policy does not exceed £100 and no secretion is required to be examined and the report is on a short form, corresponding with the Form 76A of the Mutual Life and Citizens' Insurance Company, Limited, the fee is to be not less than one guinea. In all other cases the minimum fee is to be two guineas.

Certificates in Compensation Cases.

DR. J. T. PATON (Western Medical Association) moved as follows:

> That steps be taken to get the fee for accident insurance and workmen's compensation certificates paid by the insurance company concerned.

He stated that the fee for these certificates were usually very difficult to collect from the injured patient. He held that in accident insurance claims it was in the interests of the companies to receive a medical certificate. He was not prepared to suggest how the arrangement could be brought about, but he suggested that the Council should take the necessary steps to persuade the insurance companies to adopt the practice.

The motion was seconded by DR. W. W. MARTIN (Southern District Medical Association), who thought that the companies would be willing to recognize the advantage that accrued from having the medical certificate in excluding malingering.

DR. J. KERR regarded the two questions involved in a legal light. There was no necessity provided by the *Workmen's Compensation Act* for the production of a medical certificate by the claimant. If an employee met with an accident or suffered in some other way from the effect of his employment, he made his claim for compensation. It rested with the employers or the insurance companies to require an investigation of the claim and the medical practitioner employed for this purpose would receive his fee. In the case of a claim under an accident insurance policy, the matter was quite different. No report could be given to the insurance company unless the patient gave his consent.

After some further discussion, it was resolved to leave the matter in the hands of the Council to collect the necessary information and to take such action as might be deemed advisable.

Greetings from Dr. R. H. Todd.

DR. FOURNESS BARRINGTON read a radiogram which had been received from Dr. R. H. Todd, who was then approaching Fremantle, as follows:

"Salutations Council Quarterly and Delegates."

Votes of Thanks.

On the motion of DR. FOURNESS BARRINGTON, the members of the Council carried a hearty vote of thanks to the delegates for their attendance at the meeting.

A vote of thanks and appreciation for his valuable services as Acting Honorary Secretary was accorded to DR. T. W. LIPSCOMB.

A vote of thanks was also carried to DR. FOURNESS BARRINGTON for presiding at the meeting and for his hospitality in entertaining the delegates and members of the Council at lunch.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected as members of the Victorian Branch of the British Medical Association:

ROY WILLIAM MILLER, Esq., M.B., B.S., 1921 (Univ. Melb.), Donald.

THOMAS VICTOR NIHILL, Esq., M.B., B.S., 1921 (Univ. Melb.), St. Vincent's Hospital, Melbourne.

THE WAR MEMORIAL FUND IN VICTORIA.

THE following names have been added to the list of subscribers to the War Memorial Fund of the Victorian Branch of the British Medical Association: J. B. Bell, W. E. Brunskill, E. W. Chenoweth, F. J. Orr Colahan, A. J. Frost, J. E. Gillespie, L. J. Hood, R. W. Lawrence, C. C. Marshall, F. E. McAree, R. G. McPhee, R. L. Rosenfield, J. H. Semple, E. A. Spowers.

Public Health.

ANNUAL MEETING OF THE PUBLIC HEALTH ASSOCIATION OF AUSTRALASIA.

THE first annual meeting of the Public Health Association of Australasia was held in Melbourne from September 7 to 10, 1921. New Zealand and every Australian State but one were represented.

Although the meeting began officially with registration at noon on September 7, several members accepted invitations to a meeting of the Victorian Branch of the British Medical Association at Melbourne Hospital on September 6, 1921, at which papers by Drs. N. Hamilton Fairley and Robert Fowler on latent and familial syphilis were read.

Inspections and demonstrations at the Commonwealth Serum Laboratories occupied the greater part of the afternoon of September 7, 1921. The Director of the Laboratories, Dr. Penfold, had arranged an elaborate series of continuous demonstrations in the several departments. The subjects of the demonstrations included the following: spirochæte cultures, the effect of the intravenous injection of water on body temperature, the diagnosis of typhus, pathogenic anaerobes, electrical apparatus for determining the hydrogen ion concentration of fluids, pneumococcal agglutination results, lump formation in bacterial colonies on various media, mixed cultures of human and bovine tubercle bacilli direct from the animal body, cultures of tubercle bacilli and methods of making tuberculin, *Bacillus typhosus* under the dark ground microscope, methods of titration for hydrogen ion concentration with colour indicators, the making of vaccines, the standardization of disinfectants, the removal of small-pox vaccine lymph from the calf, the corneal reaction in the diagnosis of small-pox, the production of tetanus toxin and the refusion of red blood corpuscles in the horse. There were demonstrations also of methods and equipment used in the making, storing and distributing of biological products on a large scale.

At the conclusion of the demonstrations at 3.45 p.m., the presidential address was given in the lecture room of the Laboratories by Dr. J. H. L. Cumpston, who called attention to the contributions of members of various professions to public health in its early history and welcomed the establishment of a public health organization which admitted to membership all who had a will to improve the health standards of the individual or of the community.

Later Dr. Penfold delivered an address on cancer research and outlined a promising line of investigation of the causation of cancer and its control.

In the evening the medical members attended a joint meeting of the Victorian Branch of the British Medical Association with the Preventive Medicine Section of the Branch at Melbourne Hospital. The subject of discussion was tuberculosis and the principal papers were read by Dr. Roy C. Merryweather, of Perth, Dr. F. S. Hone, of Adelaide, and Dr. L. S. Latham, Dr. R. R. Stawell and Dr. F. J. Drake, of Melbourne.

The second day of the conference opened with a business meeting at which the Association was organized into sections. This was followed by a discussion of "The Most Effective Means of Securing Satisfactory Preventive Medicine in Remote Rural Districts." The principal speakers were Dr. Gertrude Halley, Sister Edith M. Greer, Dr. W. J. Holmes and Dr. W. A. Sawyer.

In the afternoon the first subject to be discussed was "The Effect of Industrial Employment on the Health of Young Women" and the papers by Dr. A. J. Lanza, Mrs. Osborne, Miss Eleanor M. Hinder and Miss M. G. Cuthbertson were read. A paper by Dr. J. S. Purdy was read by Miss Blomfield.

At four o'clock the members made a tour of inspection of the welfare work at Myer's store. In the evening there was a special demonstration of the pasteurization and bottling plant of the Willsmere Certified Milk Company.

On the third day of the conference, September 9, 1921, the first subject for discussion was physical training and organized recreation for school children. The discussion was begun by Colonel F. J. Anderson, Mr. Frank Shann, Miss Margaret J. M. Irving, Dr. Kent Hughes and Sir James Barrett. The next subject was the necessity for a periodical stocktaking of the individual health. The papers were read by Dr. Harvey Sutton, Sir Neville Howse and Dr. Stanley Wilkinson.

Many accepted the invitation of the Melbourne University Association to attend its monthly luncheon and enjoyed hearing an address by Sir Henry Braddon.

In the afternoon Dr. W. Ernest Jones read a paper on "The Prevalence and Control of Drug Habits." A second paper on this subject was presented by Dr. A. Cossar. A short paper on the better relations between the public health and public veterinary services by Professor H. A. Woodruff followed. A paper by Dr. Harvey Sutton continued the discussion.

The last of the scientific papers were by Sir James Barrett and Dr. F. S. Hone on the most effective means of securing greater support from Parliament for health work.

In the evening the Association held a public meeting in the Assembly Hall on "Health and Industry." His Excellency the Governor-General, Lord Forster, presided and was accompanied by Lady Forster. The speakers were Dr. A. J. Lanza, Mr. Gerald Musson and Professor Osborne. His Excellency spoke of the importance of the work of the Association, particularly in the field of public health instruction. Dr. Cumpston, the President of the Association, spoke in appreciation of the attendance of their Excellencies the Governor-General and Lady Forster and Dr. Harvey Sutton moved a vote of thanks to them, which was seconded by Mr. Ostrom.

The last day of the Conference, Saturday, September 10, 1921, was largely devoted to business meetings of the Association and its Federal Council. Amendments to the constitution and by-laws were adopted and reports received. It was decided to hold the next annual conference in Sydney.

The publication of a periodical primarily for the information of members was favoured and the Executive Committee was authoried to proceed in the matter. Dr. Harvey

Sutton was appointed Editor-in-Chief and Chairman of the Publicity Committee.

Election of Office-Bearers.

The following office-bearers, members of the Executive Committee and members of the Federal Council were elected:

President: DR. W. G. ARMSTRONG, Sydney.

Vice-Presidents: MR. J. BROWNLIE HENDERSON, Brisbane; DR. EVERITT ATKINSON, Perth; DR. FRANK S. HONE, Adelaide.

Honorary Secretaries: DR. JEAN S. GREIG, Education Department, Melbourne; DR. W. A. SAWYER, Brisbane.

Members of the Federal Executive Committee: DR. J. H. L. CUMPSTON, MR. FRANK SHANN, PROFESSOR WOODRUFF, MRS. OSBORNE, DR. A. J. LANZA, DR. BROOKE NICHOLLS.

Members of the Federal Council: DR. E. S. MORRIS, PROFESSOR AGAR, MR. BRITTINGHAM, DR. D. G. ROBERTSON, DR. BROOKE NICHOLLS, MRS. OSBORNE, DR. GERTRUDE HALLEY, MISS ELEANOR M. HINDER, MRS. COWAN, DR. A. J. LANZA, DR. HARVEY SUTTON, MR. FRANK SHANN, DR. H. W. ARMIT, PROFESSOR WOODRUFF, MISS FREDA BAGE.

The election of the Honorary Treasurer was referred to the Executive Committee.

Resolutions.

The Association, at its final business meeting, adopted the following resolutions:

Rural Hygiene.

1. That, recognizing the value, especially in country districts, of education in maintaining public health, the attention of the education authorities in each State be drawn to the advisability of making the teaching of hygiene (including diet and the cooking of foods), obligatory in all schools and that the co-operation of non-State schools be also sought.
2. That representations be made to the health and education authorities as to the value of preparing and distributing publications, *e.g.*, pamphlets, leaflets, etc., dealing with special conditions affecting health, with particular relation to local needs.
3. That the value of the work of travelling dental clinics be emphasized to every education department.
4. That the health authorities be requested to furnish suitable public health laboratory facilities and adequate accommodation for infectious cases in the country and, for special emergencies, mobile hospital units.
5. That each Branch of the Association be urged to form a Publicity Committee and that their attention be drawn especially to the value of health exhibits and demonstrations at shows and exhibitions throughout the State.

Industrial Hygiene.

1. That the Section of Industrial Hygiene be requested to investigate and report to the next conference on the health of women in industrial occupations and that the following committee of the Section be appointed to make the necessary preliminary arrangements: Dr. Lanza, Dr. D. G. Robertson, Dr. Anderson, Mrs. Osborne, Dr. Helen Mayo and Miss E. M. Hinder.
2. That the Association invite the co-operation of medical men and women throughout the States in furnishing all necessary records concerning the health of women and girls.

Child Welfare.

1. That the Child Welfare Section be instructed to prepare a scheme of training, with certificate for health visitors and welfare workers, on uniform lines throughout Australia for presentation at the next annual conference.
2. That the Child Welfare Section be instructed to make special investigations into the physical health of the age period of two to five years and report to the next conference.

Milk Supplies.

That the Food and Drugs Section be requested to report at the next conference on the best methods of insuring safe milk supplies.

Bovine Tuberculosis.

That the Food and Drugs Section be asked to investigate the extent of bovine tuberculosis in Australia and to formulate a scheme for its eradication for presentation to the next annual conference.

Pulmonary Tuberculosis.

That a section of sociology be formed and that it be asked to make a special investigation into the prevalence of pulmonary tuberculosis in Australia for report to the next annual conference.

Standardization of Wassermann Test.

That the Association requests the Laboratory Section to report to the next annual conference on a standard method of performing the Wassermann test for syphilis and commends to their consideration the findings of the Medical Research Council under the Privy Council of the United Kingdom.

Cancer Research.

That the following committee be asked to report to the Executive Committee on the practicability of a scheme of cancer research on the lines suggested by Dr. Penfold and of any further action considered to be advisable: Professor Woodruff (convener), Dr. S. W. Patterson, Dr. Webster, Dr. G. W. Young, Professor Agar, with power to add to their number.

Habit-Forming Drugs.

That, in the opinion of this Association, the sale of drugs should be more closely controlled under medical supervision, particularly habit-forming drugs.

Physical Education.

That, in the opinion of this Association, it is in the best interests of the physical development of the nation that the responsibility for the physical education of the school children of Australia should be undertaken by the schools and that the means adopted should be a co-ordination of medical and dental inspection, school competitive games, physical and gymnastic exercises and lessons in hygiene and in citizenship and that the Defence Department should accord full recognition to such training.

Education.

That, in the opinion of the Association, a chair of preventive medicine should be established in each University.

That, in the opinion of the Assocation, the subject of public health should be included in the syllabi for the Junior and Senior Public Examinations.

Co-operation of Medical Practitioners.

That the Association requests the Section on Public Health Administration to report at the next annual conference on methods for securing closer and more effective co-operation of medical practitioners in public health work.

Greetings to American Public Health Association.

That the Public Health Association of Australasia, assembled in its first annual conference, sends its greetings to the American Public Health Association, about to gather for its fiftieth annual meeting, and expresses the hope that next half century of its existence will see a continued development of its great influence for better health.

Honorary Member.

That Sir George Newman be made an Honorary Member of the Association.

Resolutions of Thanks.

That the members of the Association attending the first annual conference express their hearty appreciation of the valuable assistance rendered to their gatherings by the press and welcome their co-operation in furthering the objects of the Association.

That the members of the Association place on record their sincere thanks to Councillor and Mrs. Smith, Myer's, Ltd., and all others who have extended their hospitality to the Association at its first annual conference.

Sections.

The following is a list of the Sections created and their conveners:

Public Health Administration: DR. E. ROBERTSON, Melbourne.
Child Welfare and School Hygiene: DR. HARVEY SUTTON, Sydney.
Food and Drugs: MR. J. B. HENDERSON, Brisbane.
Laboratory: DR. W. J. PENFOLD, Melbourne.
Industrial Hygiene: DR. A. J. LANZA, Melbourne.
Sociological: DR. FRANK S. HONE, Adelaide.
Dental Hygiene: DR. HAROLD V. MATTINGLEY, Melbourne.

After the business meeting the annual luncheon was held at the Union Club Hotel. This was followed by a visit to the Botanic Gardens and afternoon tea in the Kiosk as guests of Councillor and Mrs. Herbert H. Smith, of Melbourne.

THE PLAGUE OUTBREAK.

THE DEPARTMENT OF HEALTH OF THE COMMONWEALTH has issued the sixth bulletin on plague in Australia, which contains information up to October 11, 1921.

Measures have been instituted whereby accurate daily reports concerning all vessels in Australian ports will be available. The total number of plague infections in human beings up to October 11, 1921, was fourteen Of these, six proved fatal. The distribution is as follows: Brisbane, four; Townsville, five; Cairns, five.

From October 7, 1921, patients suffering from plague in Brisbane were taken to the Wattlebrae Isolation Hospital for treatment and isolation. On October 6, one infected rat was found in Wickham Street, Brisbane. Of 286 rats examined on the seventh, none were infected.

Four infected rats were found in Townsville on the sixth and seventh. It is also reported that *Bacillus pestis* was not isolated from the rat suspected of plague infection on September 30, 1921, at Darwin.

Of 249 rats and five mice examined in Sydney on October 7 and 8 and 89 further rats and three mice examined on October 10, 1921, only one was found to be infected.

The New South Wales Department of Public Health requested the Department of Health of the Commonwealth to undertake the supervision and control of intra-State vessels, in order to prevent infection spreading to the northern rivers and other ports by rat migration. In this connexion instructions were issued to the Chief Quarantine Officer in Sydney to exercise a close inspection of all vessels plying between ports in New South Wales, to insure that no goods are shipped except in rat-proof containers or under conditions equally satisfactory. All fruit and vegetables must be enclosed in rat-proof containers. Wharf patrol is to be instituted. Lastly, each vessel is to be fumigated at Sydney at the first opportunity.

Energetic steps are being taken in South Australia and Tasmania to deal with rats. No infected rats have been found in either State.

Correspondence.

BLOOD TRANSFUSION.

SIR: The admirable papers by Drs. Hurley and Upjohn, published in THE MEDICAL JOURNAL OF AUSTRALIA of October 8, 1921, should serve a useful purpose in aiding practitioners to define and delimit the application of the transfusion of blood as a therapeutic measure in the treatment of traumatic hæmorrhage and diseases associated with morbid blood conditions.

There appears, however, to be a point in connexion with blood grouping which deserves emphasis. This is a question of nomenclature. In a recent article published in the *Journal of the American Medical Association*, attention is drawn to the fact that the classification of Jansky (whose work has priority over that of Moss) is now officially accepted by the American Association of Immunologists and the American Association of Pathologists and Bacteriologists and is therefore likely to be the standard classification followed. According to Jansky's grouping, Group I. is the universal donor, Group IV. the universal recipient.

I think that this point should be noted and that, to avoid confusion and make for uniformity, the terminology officially accepted in America, should be followed by us in Australia.

Yours, etc.,
A. HOLMES À COURT.

151 Macquarie Street, Sydney,
October 14, 1921.

WAX MODELS OF SKIN LESIONS.

SIR: My attention has been directed to a slight inaccuracy in a paragraph in THE MEDICAL JOURNAL OF AUSTRALIA of September 18, 1920, page 305. The wax models of skin lesions were not actually prepared by me, but were made under my direction by a paid artist.

Yours, etc.,
W. MCMURRAY.

Macquarie Street, Sydney,
October 13, 1921.

Obituary.

GEORGE AUGUSTUS PAUL.

ON September 23, 1921, George Augustus Paul was killed by the overturning of a motor car in which he and Dr. Howard Bullock were travelling. So tragic an event would have produced a profound effect throughout the profession in New South Wales under all conditions. The regret was enhanced because this young man was extremely popular, was fast making a great reputation for himself as an ophthalmic surgeon and was unusually gifted in many directions.

George Augustus Paul was a native of Sydney. He was born in April, 1885. He was educated at the Sydney Grammar School. He was very popular among his schoolmates and won the respect and affection of the boys and the teachers. He passed the usual examinations precedent to entrance to the University of Sydney with credit at an early age. In March of the year 1902 he entered the Medical School, being then barely seventeen years of age. His course was a conspicuous success and he was recognized as a student of great promise. He completed his studies in December, 1906, and passed the examinations for the degrees of M.B. and Ch.M.. In 1907 he was appointed Resident Medical Officer at the Sydney Hospital and in 1908 he secured the position of Radiographer and Senior Resident Medical Officer at the Royal Prince Alfred Hospital. Each of these positions he held for one year. In 1909 he proceeded to Europe to study ophthalmic surgery. He visited the clinics in London, Vienna and other continental cities. For six months he worked as one of the clinical assistants at the Royal London Ophthalmic Hospital, Moorfields. On his return journey he diverted his course to learn from one of the foremost authorities on cataract work, R. H. Elliot, who was then in India. During this post-graduate trip he gained invaluable experience and equipped himself thoroughly for the career he had chosen. While in India he was taken ill with a severe attack of enteric fever, which nearly cost him his life.

He returned to Sydney and started practice in Macquarie Street as an ophthalmic specialist in 1911. It was not long before he began to establish himself in practice. During the four years following his return to Australia his reputation as a reliable and resourceful eye surgeon steadily increased. In 1915 he married Miss A. Lindsay. After his marriage he took his wife to London. He then joined the Royal Army Medical Corps with the rank of Captain and served in France. For a time he was at the base hospital at Wimmereux, where he performed a great deal of valuable work. His period of service terminated in 1917 and he then returned to Australia, but again he took the opportunity of prosecuting special study in India.

In the year 1911 he secured the coveted position of Honorary Assistant Ophthalmic Surgeon at the Sydney

Hospital. He also acted in the capacity of Honorary Ophthalmic Surgeon at the Renwick Hospital for Infants and at the Mater Misericordiæ Hospital at North Sydney. The appointment at the Mater Misericordiæ Hospital was relinquished after a few years, but he held the other two until the time of his death.

He was widely known, both within and without the medical profession, as a loyal, sterling and courteous man, full of sentiment. He possessed a great force of character and strong determination. He did not hesitate, when occasion demanded, to express what he thought, but was at the same time tender-hearted and sympathetic. He was greatly admired and respected by his colleagues, friends and patients. With him, love for his own home stood above all things. A more devoted son has never been born.

He is survived by his widow, whose bitter grief must surely be assuaged by the evidence of deep-felt sympathy and sorrow from so many of his mourning friends. Our sympathy is also extended to his aged father, his brothers and his other relatives.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

THE undermentioned have been registered, under the provisions of the *Medical Act of 1867*, as duly qualified medical practitioners:

ALEXANDER, JESSIE ELEANOR, M.B., Univ. Sydney, 1921, Lady Lamington Hospital.
BRODIE, ROBERT CHARLES ESPINASSE, M.B., B.S., Univ. Melbourne, 1921, Ipswich Hospital.
BURKE-GAFFNEY, AYLMER EDWARD, M.B., Univ. Sydney, 1911, Irvinebank.
CLARK, MILDRED, M.B., Ch.B., Univ. St. Andrews, 1919, Cairns.
COHEN, BASIL WALTER, M.B., B.S., Univ. Melbourne, 1910, Miles.
GRAY, WILLIAM ROBERT SUTHERLAND, M.B., B.S., Univ. Melbourne, 1921, Children's Hospital, Brisbane.
LANE, NOEL CHARLES KELLEHER, M.B., B.S., Univ. Melbourne, 1921, B.Sc., Univ. Queens., 1914, Brisbane.
MCKILLOP, MARTIN JOSEPH, M.B., Ch.M., Univ. Sydney, 1921, Ascot, Brisbane.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

HOSPITAL FOR SICK CHILDREN, BRISBANE: Permanent Medical Superintendent.

PRIME MINISTER'S DEPARTMENT: Two Medical Officers for the Territory of New Guinea.

RENWICK HOSPITAL FOR INFANTS: Honorary Ophthalmic Surgeon.

ROYAL PRINCE ALFRED HOSPITAL, SYDNEY: One Honorary Bacteriologist, Two Honorary Morbid Anatomists.

NOTICE TO AUTHORS.

IN July, 1919, the Directors of the Australasian Medical Publishing Company, Limited, determined that the cost of preparing blocks for the illustration of articles published in THE MEDICAL JOURNAL OF AUSTRALIA should be borne by the Company. Prior to this date the authors were required to pay for the blocks. We have the accumulation of seven years in our keeping. Authors who require the blocks for which they have paid, are requested to apply for them as soon as possible. It is proposed to destroy all unclaimed blocks on November 1, 1921.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 3, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, 6, Bank of New South Wales Chambers, St. George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

OCT. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
OCT. 26.—Victorian Branch, B.M.A.: Council.
OCT. 27.—South Australian Branch, B.M.A..
OCT. 28.—New South Wales Branch, B.M.A..
OCT. 28.—Queensland Branch, B.M.A.: Council.
OCT. 31.—Victorian Branch, B.M.A.: Council Nomination Papers issued.
NOV. 4.—Queensland Branch, B.M.A..
NOV. 8.—Victorian Branch, B.M.A..
NOV. 8.—Tasmanian Branch, B.M.A..
NOV. 8.—New South Wales Branch, B.M.A.: Ethics Committee.
NOV. 9.—Victorian Branch, B.M.A.: Final Day of Nomination for Election to the Council.
NOV. 9.—Melbourne Paediatric Society (Victoria).
NOV. 10.—Victorian Branch, B.M.A.: Council.
NOV. 11.—New South Wales Branch, B.M.A.: Clinical.
NOV. 11.—Queensland Branch, B.M.A.: Council.
NOV. 11.—South Australian Branch, B.M.A.: Council.
NOV. 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)